Environmental Impact Assessment Issues - Scoping Report

for

Canada - Manitoba Shellmouth Dam Consolidation Agreement Upgrading of Shellmouth Dam

Final Report to

Prairie Farm Rehabilitation Administration

Agriculture and Agri-Food Canada

and

Manitoba Water Stewardship

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TetrES
CONSULTANTS INC.

EXECUTIVE SUMMARY

The Canada-Manitoba Shellmouth Dam Consolidation Agreement was executed by the two governments in January 2003. It's purpose is to address historical difficulties arising from the original construction of the dam, and concerns about the effect of its operations on natural flooding dynamics over the ensuing period. It provides for compensation of past upstream damages, improved flood-management on upstream lands, upgrading of the Shellmouth reservoir capacity, and downstream studies among other things.

The Prairie Farm Rehabilitation Administration (PFRA), representing Agriculture and Agri-Food Canada, and Manitoba Water Stewardship, representing the government of Manitoba, created a Steering Committee to administer the Agreement. The Steering Committee determined the need for identification of environment-related issues having potential to arise from the proposed upgrading of the dam, and the possibility of alterations in the current operating regime. A study of the potential for environmental issues to arise, was commissioned by the Committee in July 2003. In November and December 2003, Tetr*ES* Consultants Inc. undertook a comprehensive process of consultation with communities upstream and downstream of the reservoir and the dam, soliciting local perspectives on the potential for biophysical, socio-economic, or socio-cultural issues to arise from the proposed Upgrade. Subsequently, and as part of this study, the Center for Indigenous Environmental Resources (CIER) undertook a similar process of discussions with First Nations Communities and Métis peoples perceiving themselves to be at interest in respect of the Upgrade. The joint Tetr*ES* /CIER study team also contributed it's own views about the potential for project impacts, on the basis of relevant experience.

This report documents the process of public and First Nations discussions, identifies the issues that arose during these processes, and provides perspective on the character of an appropriate Environmental Impact Assessment (EIA) process to evaluate implications of the Upgrade. Perspective on the type, magnitude, duration, potential significance, and potential susceptibility to mitigation of the issues identified during the public-consultation process is included. In addition, studies considered necessary to the success of the EIA are identified.

Consultations were also undertaken by CIER and PFRA with Métis peoples regarding their views and perspectives on the Upgrade during the production and finalization of this report.

This collateral process and its insights are documented separately in a document available directly from PFRA.

ACKNOWLEDGEMENTS

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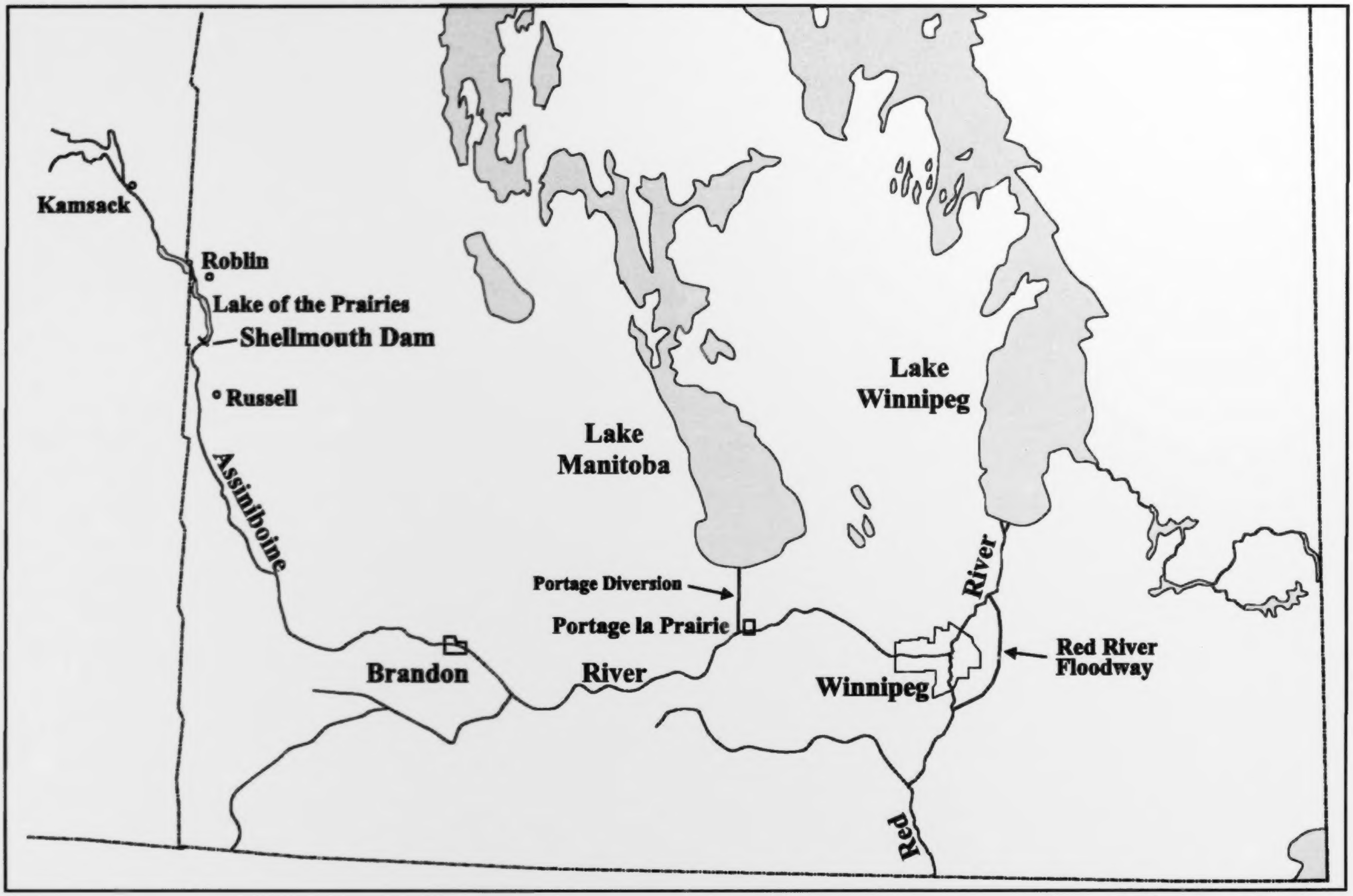
1. INTRODUCTION

The Shellmouth Dam was completed in 1970, and is located approximately 300 km northwest of Winnipeg on the Assiniboine River, just north of Shellmouth, Manitoba near the Manitoba/Saskatchewan border (50° 57' 50"/101° 25' 07"; Figure 1-1). Lake of the Prairies, the reservoir created by Shellmouth Dam, extends upstream into Saskatchewan. The Shellmouth Dam was designed by, and constructed under, the supervision of Agriculture and Agri-Food Canada's Prairie Farm Rehabilitation Administration (PFRA) and turned over to the Province of Manitoba in 1975. This dam is a key component of the flood-protection system protecting property owners, businesses and recreation assets along the Assiniboine River. In addition to flood protection, secondary water supply, recreation, and fisheries benefits have been realized.

The public demand for water supplies and improved flood protection along the Assiniboine River has been continuously increasing. Projected future water demands are likely to be agricultural, municipal and industrial in nature. Past studies have identified alternative means of providing these services using a variety of techniques, ranging from additional dams along Assiniboine River tributaries to the transfer of water from the Lake Diefenbaker Reservoir. A report by PFRA Manitoba Regional Division and Water Resources Branch, Manitoba Natural Resources (currently Water Stewardship) in 1992 identified potential dam modifications/operating regimes for the Shellmouth Dam based on an historic period from 1913 to 1990 and considering current and projected future (50-year) water demands along the Assiniboine River. Modifications to the existing structure (i.e., installation of movable gates) were considered useful to increase the capacity of the dam for provision of greater downstream water supply and for additional flexibility for dam operation for mitigating downstream flooding.

In 2003, an $8-Million, 50/50 cost-sharing agreement between the federal and provincial governments (Canada-Manitoba 2003) was signed to address present and past water-management issues on the Assiniboine River related to the Shellmouth Dam and operation of the reservoir. These funds are intended to be used to address past upstream damages, upstream land control, Shellmouth capacity upgrading and downstream studies.

A Steering Committee, including two representatives each from PFRA and Manitoba Water Stewardship, was struck to consider how best to scope and guide execution of a dam-upgrading project. Because changes in dam infrastructure and/or operating regimes were considered to


Kamsack
Roblin
Lake of the Prairies
Shellmouth Dam
Russell
Assiniboine
Lake Manitoba
Lake Winnipeg
Portage Diversion
Portage la Prairie
Brandon
River
Winnipeg
River
Red River Floodway
Red

Map of Shellmouth Dam and Assiniboine River
Figure 1-1

asbn_map
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be alterations within the meaning of the provincial *Environment Act*, the Steering Committee solicited competitive proposals to undertake a process to survey public views about the potential upgrading of the facility and/or its operating regime. Tetr*ES* was retained to undertake this Scoping Study and to design and participate in the public stakeholder and Aboriginal meetings that comprise the major elements of this study.

2. PROPOSED SHELLMOUTH DAM UPGRADING PROJECT

To address drought-related water-supply concerns, ongoing and increasing downstream water demand, and the need to increase the Shellmouth reservoir capacity to further improve flood protection on the Assiniboine River, PFRA and Manitoba Conservation have proposed an Upgrade to the Shellmouth Dam and operating regime. The 1992 report "Assiniboine River Flow Enhancement, Shellmouth Reservoir Water Supply Study", recommended:

- modified reservoir operating rules, to increase the winter target static inundation elevation without modifications to the spillway-control structure; and/or
- incorporation of gates to the existing spillway structure to control flood flows. Four options were investigated, including radial gates, vertical lift gates, rubber dams and drop-leaf gates.

The Shellmouth Dam is 22 m high, with an embankment length of 1,270 m. It has a 4.6 m diameter gated, low-level conduit and an ungated concrete spillway that is approximately 60 m (200 ft) wide (1,000 year flood).

Based on the 1992 report and preliminary economic and engineering understanding, it has been suggested that a raised drop-leaf gate be installed in the existing approximately 60 m (200 ft) wide spillway. This would allow for increasing the operating level of the reservoir by up to approximately 1.8 m (6 ft). The current summer reservoir operating target level is approximately 428 m A.S.L. (1402.5 ft), which provides about 371 million m^3 (300,000 acre-feet) of storage. If the summer operating levels were raised by 1.8 m (because the new gates were raised on the spillway), this would provide an additional 108 million m^3 (87,000 acre-feet) of storage, increasing the total storage to about 479 million m^3 (387,000 acre-feet). These figures represent one range of Dam operating scenarios among several. Also, they are dependant on the height of the gates, and on the annual climate conditions (i.e., amount of spring runoff, rainfall), which cannot be predicted with certainty.

Preliminary engineering studies are now underway to determine the feasibility of incorporating the gates and to assess alternatives to gates, including tributary storage, off-stream storage and other options. The upstream and downstream hydraulic impacts of a gated spillway are also included in the engineering work now being done by KGS Group for the Steering Committee.

The engineering studies will also include the development of a Dam Safety Databook, proposed Dam Operating Rules, and Emergency Preparedness Plans.

Downstream studies include an Environmental Impact Assessment of the proposed Upgrade, and a technical study of the impacts of reservoir operations on downstream land owners.

3. ENVIRONMENTAL SCOPING STUDY

In August 2003, Prairie Farm Rehabilitation Administration ("PFRA") and Manitoba Water Stewardship, representing the Steering Committee, hired Tetr*ES* Consultants Inc. ("Tetr*ES*") to conduct an Environmental Scoping Study to develop a sound understanding of:

- environmental and socio-economic issues that might arise in relationship to the proposed upgrading and changes in operating regime;
- requirements for public consultation in the assessment and licensing of such an Upgrade;
- regulatory requirements requiring satisfaction for the project to proceed;
- the potential geographic, temporal, administrative and regulatory boundaries and scope for a subsequent assessment and licensing process;
- the potential for impact on First Nation interests and issues;
- development of a "path forward" for securing the necessary formal regulatory approvals, assuming the project is deemed to be feasible, including a suggested scope and schedule for the subsequent Environmental Impact Assessment (EIA); and
- areas of public or technical uncertainty requiring attention before or during the EIA.

3.1 STUDY GUIDANCE

As previously noted, the study was administered by a federal/provincial Steering Committee. The Steering Committee consists of four people, two of whom are with the Manitoba Regional Division of Prairie Farm Rehabilitation Association ("PFRA") and two of whom are with Manitoba Water Stewardship.

3.2 STUDY METHODS

To complete this scoping study, Tetr*ES* conducted field visits, undertook literature reviews, briefly reviewed relevant historic engineering studies (e.g., for indications of historic expressions of public concern), applied relevant professional experience, and undertook an involvement program with invited public stakeholders (Appendix A), civil servants in Manitoba and

Saskatchewan and regulatory personnel, including one public Open House. Tetr*ES* also briefly reviewed relevant other documents addressing issues and concerns expected to arise, and/or reported during the public involvement program. Tetr*ES* retained the Centre for Indigenous Environmental Resources (CIER) to help design and execute a process for engaging First Nations and Métis communities at interest in the EIA issues-scoping process.

It is important to note that this study deals only with the potential for issues arising from the Upgrade, without undertaking assessment of potential impacts or effects, or their mitigability. Environmental assessment is proposed to occur in a following project phase.

3.3 CITIZEN INVOLVEMENT PROGRAM

The citizen-involvement program associated with the environmental issues scoping study included a series of eight meetings with invited stakeholders (Appendix B), one public "Open House", four meetings with First Nations communities on or near the Assiniboine River, one meeting with Manitoba regulatory review personnel, and several one-on-one meetings between the study Steering Committee and various government departments in Manitoba and Saskatchewan. The issues raised in the one-on-one meetings were documented by members of the Steering Committee and were provided to Tetr*ES* for incorporation into the scoping-study report. Meetings with interested Métis communities on or near the Assiniboine River occurred as this report was being finalized.

A minimum of three Steering Committee members attended all of the stakeholder meetings and the Open House. At each of the meetings, the Steering Committee presented identical information about the project and the scoping-study process (e.g., Appendix C). Standardized issue-recording forms were utilized in the process (i.e., at all meetings; cf. Appendix D). Tetr*ES* facilitated and documented, with Steering Committee input, the meetings with the public and regulatory personnel. CIER facilitated and documented, with Steering Committee input, the meetings with the interested First Nations (Appendix E) and Métis communities. CIER's report documenting the meetings with Métis peoples is available from PFRA.

3.3.1 Participant Selection

Tetr*ES* used information gathered during two field visits to the Shellmouth Dam area to develop an initial list of people considered likely to be interested in attending meetings about the Shellmouth Dam Upgrading Project and the Environmental Issues Scoping Study. Consideration of the expected interests of the local Rural Municipalities, towns, cities, Conservation Districts, irrigator groups, cattle and vegetable production associations, industries adjacent to the Assiniboine River in Manitoba and Saskatchewan, and environmental groups involved in relevant issues, provided a more comprehensive list of contacts. Individuals or parties considered likely to have common interests or geographic focus were grouped accordingly, to organize the growing list of parties at interest into a manageable number of potential contact groups. The names of local recreation and tourism operations, for example, helped to create a list of people likely to be interested in a meeting focusing on recreational issues over the whole region. CIER identified 13 First Nations (10 in Manitoba and 3 in Saskatchewan) and approximately 20 Métis communities that live near the Assiniboine River and/or use it (and adjacent land) for traditional practices (cf. Appendix E re: First Nations).

3.3.1.1 Stakeholder Meetings

Eight stakeholder meetings were scheduled, each with a proposed focus (cf. Table 3-1). Two meetings were held for the local Manitoba governments in the southern reaches of the Assiniboine River due to a conflict with the scheduled November 26 meeting and the previously scheduled Association of Manitoba Municipalities Annual Conference.

A standard invitation letter (see Appendix A) was faxed to each of the invited participants. While each person was invited to a particular meeting based on Tetr*ES*' and the Steering Committee's assessment of their expected particular interest(s), the letter included a table with the complete list of meeting dates, times and locations for people unavailable to attend the suggested meeting to make alternative arrangements for meeting attendance. On several occasions, there were people in attendance at alternate meetings than were indicated in the invitation letter, because of their own travel requirements or constraints, or a desire to participate in a different interest group than was suggested by the Study Team. Some participants attended multiple meetings.

TABLE 3-1

PUBLIC MEETING SCHEDULE, LOCATIONS AND ATTENDANCE

MEETING DATE & LOCATION	TOTAL ATTENDANCE
November 26 9:00 a.m. – **Portage** Local Manitoba Government (south)	8*
November 26 1:30 p.m. – **Portage** Agricultural Organizations / Irrigators	12
November 27 9:00 a.m. – **Brandon** Downstream Users	23
December 1, 3:00 p.m. – **Kamsack** Local Saskatchewan Government	21
December 2, 9:00 a.m. – **Russell** Local Manitoba Government (north)	21
December 2, 2:00 p.m. – **Russell** Local Interests / Groups	47
December 8, 7:00 p.m. – **Russell** Public Open House	33
December 10, 7:00 p.m. - **Winnipeg** Environmental Groups	5
December 15, 1:30 p.m. – **Portage** Local Manitoba Government (south)	20*
TOTAL PUBLIC	**190****

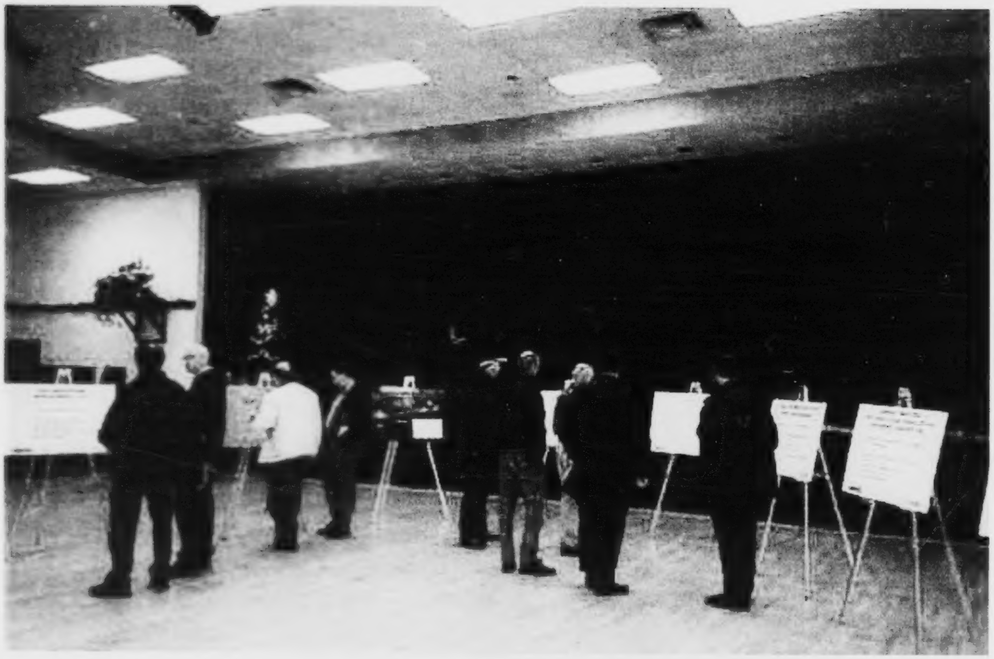
*Two meetings were scheduled for local southern Manitoba municipal government representatives, due to the simultaneous occurrence of The Association of Manitoba Municipalities annual conference.

**The attendance was not screened for persons attending multiple meetings.

To help increase the reach of the invitation letter, and to ensure all potentially interested stakeholders had the opportunity to be represented, invitees were encouraged to forward the letter to others who might also be interested in attending. This approach was very successful; many attendees were not included on the original contact list.

The public Open House was also a means of reaching people who were not identified as having an obvious particular interest in the Project. An advertisement for the Open House was placed in The Roblin Review and The Russell Banner newspapers, and an advertisement on the Yorkton radio station included an invitation for people to attend the public Open House in Russell. The date, time and location of the Open House were also listed in the table of meetings provided with the invitation letter.

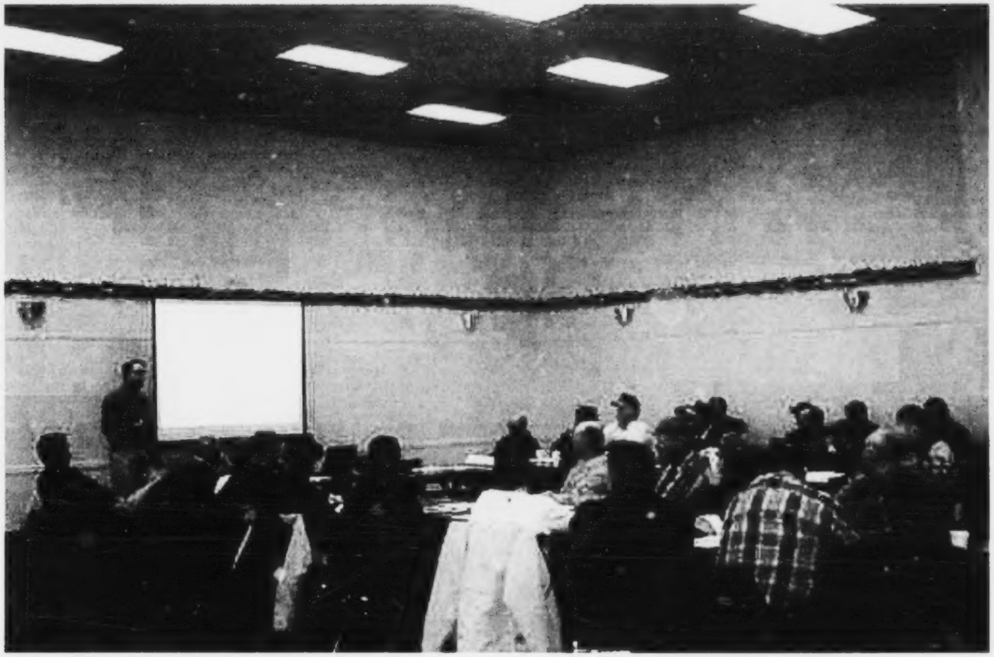
The stakeholder meetings and Open House were well attended. Table 3-1 provides the attendance for the eight meetings and public Open House coordinated by Tetr*ES*. (The Aboriginal liaison process coordinated by CIER has been documented separately [Appendix E]). A complete list of people who attended the meetings and people who commented by mail/email/phone after the meetings, is provided in Appendix B "Storyboards" were used at the meetings and at the Open House to provide an overview of the information available on the Shellmouth Dam Consolidation Agreement, the proposed Upgrade Project, Project activities (e.g., dam-safety analysis, preliminary engineering studies, environmental issues scoping study), the nature of the environmental scoping study, and the need for public input (see Photos 3-1, 3-2). After approximately a half hour of time to view the storyboards and to ask questions of members of the Steering Committee, Tony Kettler (the scoping study project manager) gave a PowerPoint presentation using slides identical to the storyboards (see Appendix C and Photos 3-3, 3-4). Following the presentation, the participants were asked to contribute their thoughts on the Project and to voice any environmental, economic, social or cultural issues or concerns. Tetr*ES* staff recorded these comments (see Photo 3-5). Standardized forms on the table allowed the participants to write down their comments to leave after the meeting. An identical, stamped form with a return address was also provided for people to comment on the project after the meeting, at their leisure. Each attendee was also provided with a copy of the PowerPoint presentation. Maps were also available during the Open House to allow people to locate their lands and provide specific comments on the map (see Photo 3-6).



Storyboards being reviewed,
Dec. 8, 2003 Open House
7:00 p.m.; Russell, MB
Photo 3-1

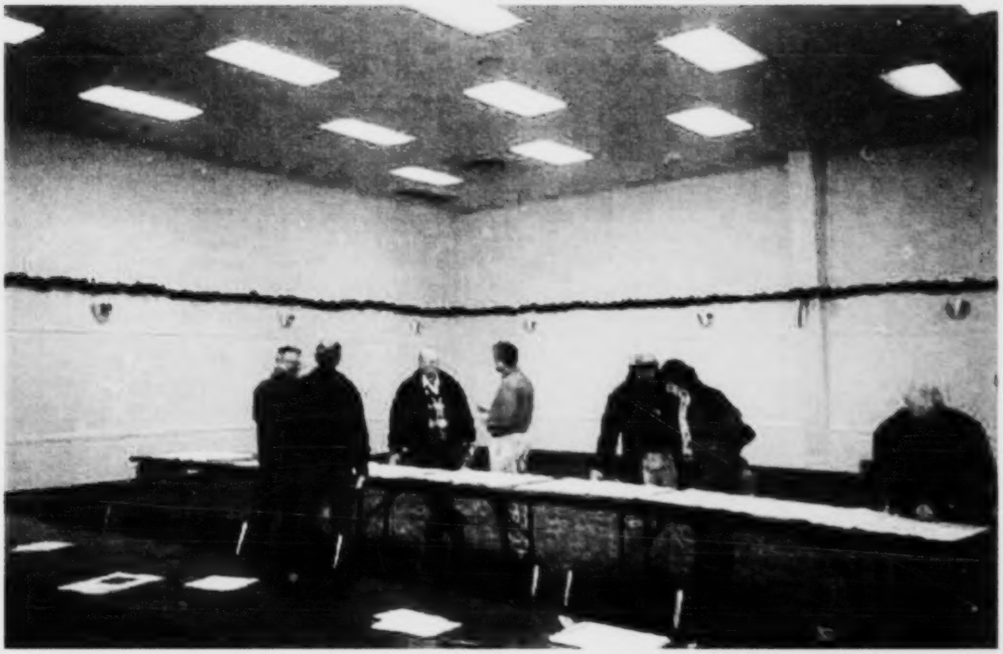
Storyboards being reviewed,
Dec. 1, 2003 Meeting
3:00 p.m.; Kamsack, SK
Photo 3-2

**Information Being Presented
to Local Government and
Interested Parties; Kamsack, SK
Dec. 1, 2003; 3:00 p.m.**
Photo 3-3



**Information Being Presented to
Cottage Owners, Recreationalists
and Others; Russell, MB
Dec. 2, 2003; 1:30 p.m.**
Photo 3-4

Group Discussion
Portage la Prairie, MB
Nov. 26, 2003; 1:30 p.m.
Photo 3-5



Identification of Issues
Using Maps; Russell, MB
Dec. 8, 2003 Open House; 7:00 p.m.
Photo 3-6

Following the consultation process, the Steering Committee received information requests (e.g., copies of PowerPoint presentation, copies of Consolidation Agreement) from several environmental non-government organizations (e.g., Canadian Nature Federation), private businesses (e.g., Lake of the Prairies Ltd., Killman Cottage Developments, etc.) and local economic development groups (e.g., Pelly Trail Economic Development Group, Shellmouth Assiniboine Valley Economic Development), to which it responded directly (e.g., Kettler *pers. comm.* 2004 a,b,c).

4. ISSUES REQUIRING ATTENTION IN EIA

The stakeholder meetings and discussions with Aboriginal peoples were very useful in raising issues that were not readily identifiable in either the professional literature or in past technical reports on the Shellmouth Dam and the local reach of the Assiniboine River. A record of the comments made by the participants in each meeting is provided in Appendices F through O. Comments were also provided through mail-back cards, letters and emails.

The Study Team considers that the issues raised often fall into multiple categories (e.g., in cases where a specific query or comment contained various ideas). The occurrences of specific identifiable issues were tallied and the total number of occurrences for each issue was used to determine the relative ranking of the issue, as inferred from the frequency that they were raised by the participants in this process, at the time. Tetr*ES* considers that all issues merit investigation during subsequent studies or during the environmental assessment of the Project.

Tetr*ES* has not, in reporting the issues raised, offered any judgement as to their importance or significance, but has rather sought more to capture the query or concern accurately and succinctly, without any form of implied commentary or evaluation.

The issues that were raised by the stakeholders, Manitoba and Saskatchewan government departments, and regulatory personnel are discussed in Sections 4.1 through 4.2.

4.1 ISSUES RAISED BY STAKEHOLDERS

4.1.1 Invited Stakeholders

The issue categories that became evident, in the stakeholder meetings and in the Open House, and the tally of issues that occurred at each of the 8 stakeholder meetings and the public Open House, are provided in Table 4-1. Issues that arose from letters and comments received by the study team or the Steering Committee following the public meetings have also been included. Each of the issues is described below.

TABLE 4-1

SHELLMOUTH DAM: OCCURRENCE OF PUBLIC ISSUES, BY MEETING

ISSUE	November 26 a.m.	November 26 p.m.	November 27 a.m.	December 1 p.m.	December 2 a.m.	December 2 p.m.	December 8 p.m.	December 10 p.m.	December 15 p.m.	Mail-back comments	TOTAL
General Support - of the Project; of the goals	0	5	1	0	0	0	1	0	1	0	8
Alternatives - including tributary storage; the need to look at alternatives	2	4	2	1	3	3	10	4	3	6	38
Dam Operation -including a lack of understanding regarding operation, poor operation, potential changes to operation	0	7	10	6	12	15	13	1	0	6	70
Dam Safety	1	2	2	0	1	0	2	1	0	2	11
Increased Recreation / Tourism	0	2	0	0	1	1	2	0	0	0	6
Decreased Recreation / Tourism	0	0	0	0	2	0	5	1	0	7	15
Loss of farmland, farming opportunities, decreased assessment value of land	0	4	0	5	5	0	4	0	1	2	21
Increased farming opportunities, irrigation possibilities	2	2	0	0	0	0	0	0		0	4

Table 4-1 (cont'd)

ISSUE	November 26 a.m.	November 26 p.m.	November 27 a.m.	December 1 p.m.	December 2 a.m.	December 2 p.m.	December 8 p.m.	December 10 p.m.	December 15 p.m.	Mail-back comments	TOTAL
Risk to Infrastructure	0	0	3	1	3	2	4	0	1	3	17
Water Quality - including siltation, submerged vegetation (mercury methylation), sedimentation)	5	2	2	3	12	2	3	1	0	3	33
Lack of government capacity -including lack of sufficient monitoring of inflow, lack of snow surveys, lack of point of contact within government to address public concerns	0	1	3	0	2	3	3	0	0	3	15
The need for economic analysis	1	1	0	0	0	1	0	0	1	0	4
Increased erosion	0	6	4	0	5	7	7	0	0	7	36
Increased drainage	0	1	2	0	5	2	9	0	0	4	23
Risk to / benefits to Fish and Sport Fishery	0	5	1	2	3	1	7	0	1	5	25
Risks due to climate change, evaporation	1	1	1	0	0	0	0	1	0	0	4
Saskatchewan's Needs for Water	0	0	1	11	1	0	0	1	0	0	14

Table 4-1 (cont'd)

ISSUE	November 26 a.m.	November 26 p.m.	November 27 a.m.	December 1 p.m.	December 2 a.m.	December 2 p.m.	December 8 p.m.	December 10 p.m.	December 15 p.m.	Mail-back comments	TOTAL
Kamsack farmers' agreement	0	0	0	4	1	0	0	0	2	0	7
Unresolved issues from past damages -especially 1995 flood -lack of equitable treatment in Manitoba and Assinboine area regarding damages; desire for equality	0	4	2	0	16	1	10	0	6	7	46
Changes in Flood regime -including seasonal and duration changes	0	5	7	0	7	0	3	1	0	1	24
Desire for ongoing communication -including request for access to reports via a project website	1	2	1	1	0	0	0	2	1	0	8

Table 4-2 provides Tetr*ES*' preliminary understanding of the nature of the issues, the potential magnitude and mitigability, and the need for additional studies and/or attention in a subsequent EIA.

A total of 21 specific issue categories were raised. The discussion of each presents the opinions of the participants at the stakeholder meetings and the Open House. The listing of issues raised by the public should not be interpreted as an indication of Tetr*ES*' assessment of their significance. Consistent with the Steering Committee's Request for Proposals, and the oft-stated desire expressed by participants to contribute to the analysis of issues and their significance, it is proper that analysis of issues significance occurs during the subsequent Environmental/Impact Assessment process, with stakeholder and Aboriginal peoples input.

The five issues most frequently reported (between 70 and 33 times) by the participants in this process, are:

- dam operations and their consequences;
- unresolved past operating issues (related primarily to the 1995 flood);
- alternatives to upgrading the Shellmouth Dam;
- increased erosion (on the reservoir and downstream of the Dam); and
- future water quality of the reservoir and downstream on the Assiniboine River.

4.1.1.1 Dam Operation

The operation of Shellmouth Dam was the most frequently reported issue (stated to be of interest/concern 70 times). Tetr*ES* notes that the majority of the participants who attended the Scoping Study meetings do not appear to have a sound understanding of the decision rules guiding dam operations (e.g., *"we need a better understanding of government management decisions", "why do you draw down the lake so early?")*. Increased education related to dam operation appears to be required if people are to embrace the concept of the dam Upgrade and proposed changes to the current operating regime.

Additional questions and comments expressed the sentiment that the dam is "*poorly operated*", and that the past and current operation of the dam results in an altered flood regime that has

TABLE 4-2

SHELLMOUTH DAM MEETINGS: SUMMARY OF PUBLIC ISSUES

Issue	Relative Ranking of Issues (based on frequency)	Occurrence	Nature (positive/ negative)	Extent (spatial/ temporal/ historic)	Magnitude (large/ medium/small)	Migitability (yes/ no/NA/outside of scope)	Need for Additional Information, including attention in EIA*
Dam Operation **-including a lack of understanding regarding operation, concerns about "poor" operation, potential changes to operation**	**1**	70	Negative	Spatial, Temporal, Historic	Large	Unknown	Yes
Unresolved issues from past damages **-especially 1995 flood** **-lack of "equitable treatment" in Manitoba and Assiniboine area regarding damages;** **-desire for equality**	**2**	46	Negative	Spatial, Temporal, Historic	Large	Outside of Scope	Yes (but only by way of context for present concerns, not as subjects for impact assessment)
Alternatives **- including tributary storage;** **- including the need to look at engineering alternatives**	**3**	38	Positive (for people wanting alternatives to be explored now); Negative (for those believing alternatives are not now being fully considered)	Spatial	Large	N/A	Yes
Increased erosion **-including concerns about drainage dynamics**	**4**	36	Negative	Spatial, Temporal	Large	Yes	Yes
Water Quality **- including siltation, algae, submerged vegetation, mercury methylation, sedimentation of fisheries habitats**	**5**	33	Negative	Spatial, Temporal	Large	Yes, Unknown	Yes

Table 4-2 (cont'd)

Issue	Relative Ranking of Issues (based on frequency)	Occurrence	Nature (positive/ negative)	Extent (spatial/ temporal/ historic)	Magnitude (large/ medium/small)	Migitability (yes/ no/NA/outside of scope)	Need for Additional Information, including attention in EIA*
Risk to/benefits to Fish and Sport Fishery	6	25	Negative/Positive	Spatial, Temporal	Large	Yes	Yes
Changes in Flood regime -including seasonal and duration changes	7	24	Negative	Spatial, Temporal, Historic	Large	Yes, Unknown	Yes
Increased drainage rates to Assiniboine River	8	23	Negative	Spatial, Temporal	Large	Unknown**	Yes
Loss of farmland, farming opportunities, decreased assessment value of land	9	21	Negative	Spatial, Temporal, Historic	Large	Outside of Scope***	Yes
Risk to Infrastructure	10	17	Negative	Spatial	Medium	Yes	Yes
Lack of government capacity -including lack of sufficient monitoring of inflow, lack of snow surveys, lack of point of contact within government to address public concerns	11	15	Negative	Temporal, Historic	Large	Unknown	Outside of Scope
Decreased Recreation / Tourism	11	15	Negative	Spatial, Temporal	Large	Yes	Yes
Saskatchewan's Needs for Water	12	14	Negative/Positive	Spatial, Temporal	Medium	Unknown	Yes
Dam Safety	13	11	Positive	Spatial, Temporal, Historic	Large	Yes	Occurring

Table 4-2 (cont'd)

Issue	Relative Ranking of Issues (based on frequency)	Occurrence	Nature (positive/ negative)	Extent (spatial/ temporal/ historic)	Magnitude (large/ medium/small)	Migitability (yes/ no/NA/outside of scope)	Need for Additional Information, including attention in EIA*
General Support - of the Project; of the goals	14	8	Positive	N/A	N/A	N/A	N/A
Desire for ongoing communication -including request for access to reports via a project website	14	8	Positive	Temporal	Large	N/A	No
Kamsack farmers' agreement	15	7	Negative / Positive	Spatial, Temporal, Historic	Medium	Yes	No
Increased Recreation / Tourism	16	6	Positive	Spatial, Temporal	Medium	Yes	No
Increased farming opportunities, irrigation possibilities	17	4	Positive	Spatial, Temporal	Large	N/A	No
Risks due to climate change, evaporation	17	4	Negative	Temporal	Medium	Unknown	Yes
The need for comprehensive economic (cost-benefit) analysis of the Upgrade	17	4	Positive	Temporal	Medium	N/A	Yes

* and after EIA is completed, as the information may have potential to affect management of the dam and reservoir.

** Upstream drainage and increased sedimentation should be included in the scope of the assessment.

*** Lands experiencing flooding downstream of the Dam due to operating rules and/or dam modifications are considered to be within the scope of the Project and assessment.

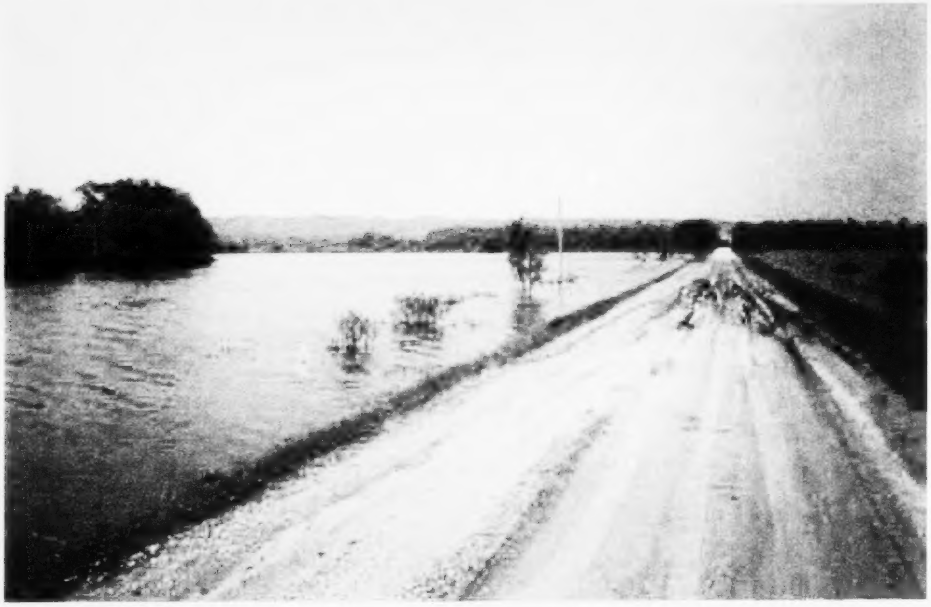
caused damages to the riverbanks and adjacent land (e.g., Appendix H p.4). Higher than natural water levels on the Assiniboine River are believed by respondents to occur later in the season and to be longer in duration (see Section 4.1.1.7). The rapid change in water levels in the river, noted by many participants, suggested to them that the conduit has been opened and closed too quickly in the past. Assuming current operation, it was noted that the gates would result in floods that occur later and longer, and that the gates would just exacerbate the effects of the current negative downstream effects of the dam (Appendix J, p.4).

Notwithstanding the apparent lack of understanding of operating rules, the fervour of the expressed concerns suggests a high need for clearly communicated, graphical explanations of past and potential new decision rules, possibly through a series of outreach/education processes.

4.1.1.2 Unresolved Past Damages

There is a significant amount of anger and frustration evident among downstream landowners related to the operation of the Dam (Appendix J), and in particular, to the perceived role of the Dam in the 1995 flood (See Figure 4-1). This issue was the second most prevalent (raised 46 times). Farmers living downstream from just south of the Shellmouth Dam to Woodsworth R.M. expressed the opinion that they were harmed in 1995 and continue to be harmed by the current operation of the Dam (see Section 4.1.1.1). They have reported that land-value assessments also decreased after the 1995 flood (e.g., land south of the Dam in the R.M. of Shellmouth-Boulton). To mitigate the harm caused by the operation of the Dam, many people would like to negotiate with the government for an agreement similar to the compensation package offered to the Kamsack farmers (Appendix J, p.3).

The fact that compensation was provided to the farmers in the Red River Valley in 1997 is difficult for farmers on the Assiniboine River to accept, because they did not receive similar government support after the Assiniboine River flood in 1995. According to these landowners, previous government comments referring to the "*natural risk of flooding associated with living in a river valley*" are no longer valid after the government made compensation available in 1997 to Red River farmers. Farmers on the Assiniboine River who were recipients of compensation



High Water Levels on the Assiniboine River, June 8 1995

Figure 4-1

(Photo by Mr. Pearn)

advised that they received less structural compensation than did the Red River farmers, no lost-income compensation and no social support (e.g., stress phone lines).

Tetr*ES* was advised that the R.M. of Shellmouth-Boulton has never been completely compensated for the loss of the assessment of the land when the Shellmouth Dam was first built in the late 1960s. Meeting participants stated that government encouragement of recreational development on the Lake was considered a means of compensation for lost tax revenue. The perceived loss of the benefits that can be now realized from these investments arising from concerns about higher water levels on the Lake, should the Dam be upgraded, was reported to be a substantial concern by the local population (see Section 4.1.1.12).

4.1.1.3 Alternatives

The need to look at alternative means of achieving the declared flood-protection and water-supply goals of the project was clearly and frequently expressed in the meetings. Comments and questions relating to this issue arose 38 times, making "alternatives" the third most prevalent issue (e.g., Appendix F, p.2; Appendix G, p.2; Appendix L, p.1). Questions related primarily to alternatives to installing gates on the Shellmouth Dam (i.e., whether or not alternatives to gates were being looked at), including building dams elsewhere on the Assiniboine River (e.g., near Binscarth, Holland); options for managing water on the tributary rivers (e.g., Qu'appelle, Souris rivers [e.g., Appendix J, pp 1-2]) and drainage channels; building off-stream storage; and frustrated comments from residents near the Dam who feel that *"we have finally gotten used to living with the Dam...you should build something somewhere else and let us be"*.

4.1.1.4 Increased Erosion

Concerns about increased erosion caused by releases from Shellmouth Dam since the Dam was built in 1970 (see Section 4.1.1.7), and the fluctuating water levels that are caused by the operation of the Dam (see Section 4.1.1.1), were the fourth most prevalent (raised 33 times). Several people brought photographs showing the effects of erosion, including lost and slumping riverbanks (see Figures 4-2 and 4-3). According to many participants, there has been

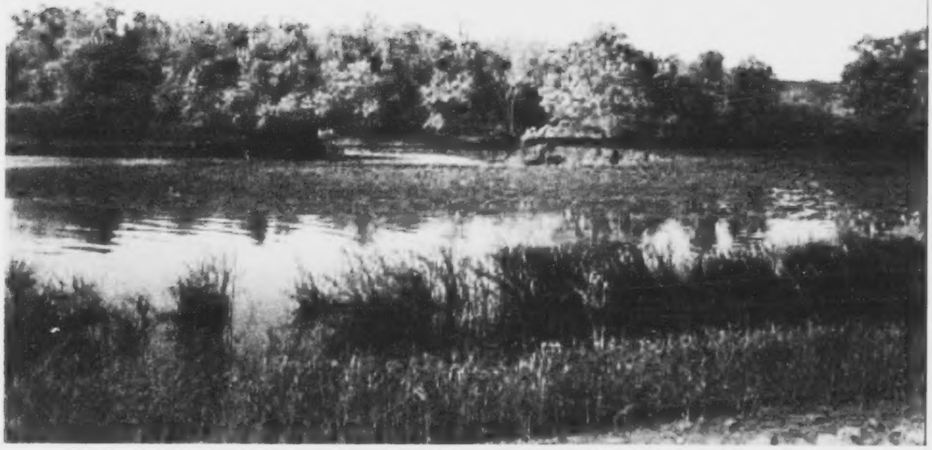


Figure 4-2

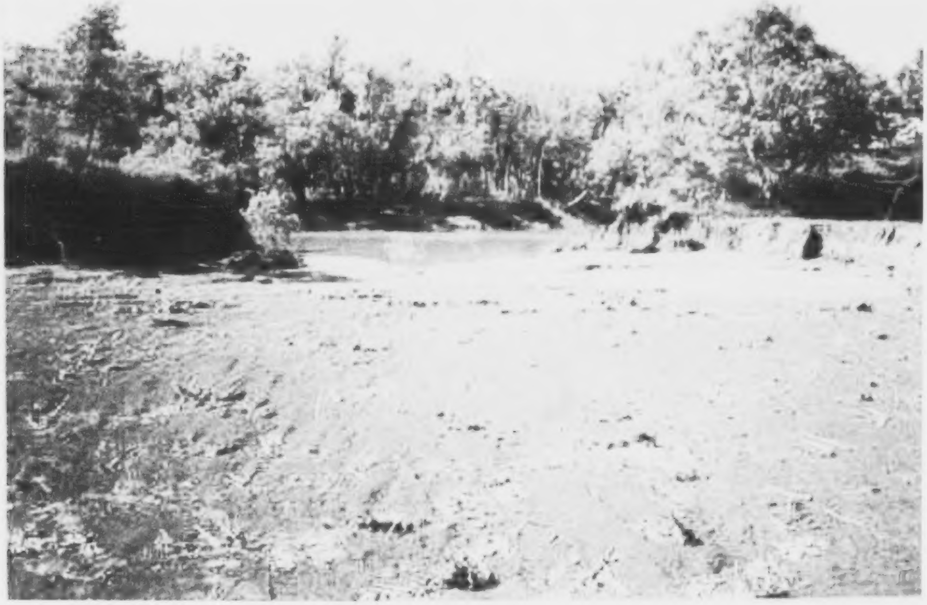


Figure 4-3

Effects on the Riverbank Caused by the 1995 Flood on the Assiniboine River

(Photos by Mr. Pearn)

pearn pcs; ms\01\0320\shel

significant erosion along the Assiniboine River downstream of the Shellmouth Dam especially when flooding occurs later, after frost has left the soil, increasing its erodability (e.g., Appendix J. p.1). Erosion on the banks of the Lake of the Prairies was also reported as a concern dating back 25+ years (cf. Barber 1978). In particular, landowners with recreation developments on the reservoir (e.g., campgrounds and resorts) are concerned about the potential for lost/unstable docks, boat launches and lakeside property.

Many participants expressed concern for the potential for increased water levels downstream in the river, and that operations resulting in a rapid drop in the downstream water level (and larger, later flooding) that could be associated with gates on Shellmouth Dam would increase the potential for erosion on the reservoir. In turn, this was reported likely to exacerbate the current effects of erosion on the riverbanks. Fluctuating water levels on the Lake of the Prairies being increased (and creating new high-water marks) were reported to be of concern regarding increased erosion and loss of the shoreline. While it was acknowledged by many participants that rivers do erode their banks naturally, there was consistent concern expressed that higher water levels and greater fluctuations in level would accelerate and/or exacerbate this historic erosion.

4.1.1.5 Water Quality

"Poor" water quality was an issue that was raised 33 times by the participants, making it the fifth most prevalent issue (e.g., Appendix K, p.3). According to the participants, the existing water quality in the Lake of the Prairies and Assiniboine River is "poor" (they did not tend to define "poor"). They reported that this has been exacerbated by increased sedimentation, caused by long-term erosion (see Section 4.1.1.4). People reported that they are very concerned that higher surface-water levels in the river, combined with fluctuations in the water levels, will result in increased sedimentation, contributing to a problem of poorer water quality. (Tetr*ES* notes that there seemed to be little understanding that sedimentation tends to increase water clarity, perhaps because erosion was judged to be constantly contributing new suspended sediment. There was also little acknowledgement that prairie rivers are naturally turbid).

There was also mention of the possibility that the reservoir is accumulating sediment and nutrients, and thereby contributing to high dissolved nutrient levels in the river. The submersion of vegetation that would occur if the reservoir surface water were kept at a higher level (as would occur if gates were built on the Shellmouth Dam) was also reported as a concern. There was also concern expressed that the associated methylation of mercury would contribute to decreased water quality. The Steering Committee noted, however, that any shrub or treed vegetation would be removed prior to an increase in the water level.

Some representatives of downstream cities and industries that use the water in the River for domestic and industrial uses expressed concern about potential decreases in the water quality. They advised that current treatment systems and operating regimes are appropriate for the current water quality, but might require costly upgrading (and higher operating costs) if the current raw water quality deteriorates because of the Upgrade or changes to the operating regime.

4.1.1.6 Impacts on the Fish and Sport Fishery

The issue of fish health and the sport fishery was raised 25 times (sixth most prevalent issue). The sport fishery on the Lake of the Prairies is an important tourism and economic resource for the local area and people's concerns appeared related to this. People were uncertain whether an Upgrade to the Dam (and resulting increase in the size of the reservoir, and increased potential for downstream flows) would create risk or benefits to fish and fish habitats. Some recommended that the Upgrade incorporate provision for migratory fish movements (Appendix L, p.1). People were also curious about the role of, and any initial comments provided by, Fisheries and Oceans Canada in the execution or review of the Upgrade.

4.1.1.7 Changes to the "Natural" Flood Regime Resulting from the Shellmouth Dam

There was much discussion by the participants about the way they experience flooding. The altered flood regime resulting from the Shellmouth Dam and its operation, and the associated perceived negative impacts, were raised 24 times, making this issue the seventh most prevalent. (Tetr*ES* notes that these participants rarely noted the flood-control benefits of the Dam). Prior to the construction of the Dam, the Assiniboine River reportedly flooded early in the spring season while the land remained largely frozen. According to the participants, these floods were large but the water did not remain on the land for long periods of time; as the water level in the river receded, the water drained relatively quickly off the land. Participants advised their strong belief that current floods on the Assiniboine River occur later in the season (e.g., Appendix L, p.1). They believe that the Dam holds back large amounts of water to reduce and delay the peak of the flood. Participating farmers noted that this delays seeding of their lands in the spring, just the way it did for upstream farmers (cf. Barber 1978), who received compensation for this impact while they (the downstream farmers) have not. In combination with this, they report that the river has higher surface-water levels maintained throughout the spring and summer than was the case before the Dam existed. According to these participating landowners, land drainage is impeded, relative to the previous natural state, and their lands are now flooded for longer periods of time.

One farmer noted "*the minute you built that Dam, the government could no longer say to us – 'well, you live in a river valley, so you're going to get flooded' because the floods are not natural anymore*".

4.1.1.8 Increased Drainage

Concerns about increased and more rapid drainage into the Assiniboine River (including in Saskatchewan), and the impact on the water levels in the river, were mentioned 23 times during the meetings (e.g., Appendix L). Many people stated a belief that "the government" (not defined) has not enforced drainage limitations and that, as a result, there is "significantly more water" entering the Assiniboine River more quickly than in the past. Downstream residents believe that this results in high water levels south of the Shellmouth Dam that can cause flooding. The fact that two provincial jurisdictions are involved in this issue, and should work together to enforce drainage requirement, was noted by many participants (Appendix I).

Suggestions offered to manage this runoff water included installing gates on drainage channels to delay the water from entering the river for a short period of time, and selectively recreating wetlands to intercept, treat and decrease the flow of the water to the river (one farmer reported that he had worked with Ducks Unlimited to create this kind of riparian wetland). Participants also perceived a link between the issue of increased and rapid drainage and the issue of riverbank erosion.

4.1.1.9 Loss of Riparian Farmland, Farming Opportunities, and Decreased Land Value

The potential loss of riparian farmland and farming opportunities that could result from increased flow in the Assiniboine River and larger, later floods that could be associated with a gated Upgrade to the Shellmouth Dam (assuming the current operating regime), were raised as issues 21 times throughout the meetings. People spoke passionately about past damages and a lack of adequate compensation (see Section 4.1.1.2). Many people reported that they suffered damages in 1995 that now makes them wary of any additional risk of increased losses of productive land that might occur because of the Upgrade.

Participants reported that, after the original construction of the Dam three decades ago, many downstream farmers changed their operations to seed higher value crops (versus pasture, for example, on riparian lands) given their belief in public statements that the Dam would prevent flooding of these lands. Participants noted that their reliance on "incorrect" information was a factor contributing to increased damages now being experienced on these lands when floods cannot be prevented by the Dam.

4.1.1.10 Risk to Infrastructure

The potential for risk to existing infrastructure (e.g., cottages, bridges and roads) from the Upgrade was mentioned 17 times throughout the meetings (e.g., Appendixes I and K). Implicated bridges that were noted by the public include the Provincial Trunk Highway (PTH) No. 5 highway bridge (and grade) west of Roblin; Saskatchewan Provincial Road No. 369 bridge (south of Togo); two low bridges in the R.M. of Miniota (that are reportedly often washed out in the spring); and the old Highway 83 bridge across the Shell River reported to provide access to the Asessippi Ski Hill. Boat launches and cottage/camping/resort properties that were also noted by the participants as being potentially at risk include: Pyotts Landing; Rickers Campground; Kilman Cottage Development; Kilman Enterprises; Keatings; Mitchell's Campground; Asessippi Provincial Park (beach, marina, boat dock, etc.); and government built boat launches along the reservoir (also see Section 4.1.1.12).

Several rural municipalities (e.g., Shellmouth-Bolton, Shell River, Woodsworth, Miniota, etc.) reported concern about the costs associated with repairs to or replacements of lost roads and bridges during flood periods. It was also noted that in some areas, as the riverbanks erode and as the river widens, the bridges need to be modified or they will no longer be useable.

4.1.1.11 Lack of Government Capacity

Concerns for lack of government capacity to deal with local flood-related issues, especially effective forecasting and operation of the Dam, was raised 15 times. Participants advised that local populations near the Dam have consistently experienced difficulties locating knowledgeable and responsible persons within government, mandated to talk to about downstream flooding, lost income, and operational issues and questions. According to the participants who raised these issues, there appeared to be no 'point of contact' within the government responsible to the people for the Shellmouth Dam, notwithstanding the existence of the Steering Committee (cf. Appendix K, p.1).

Participants specifically noted the decrease over the past three decades, of "on-the-ground" government staff needed to gather the snowpack and other information that contributes to fully informed flood forecasting and runoff modelling. Snow surveys that were completed in the past are no longer done and many people felt that this contributed to the flooding in 1995. According to a June 1995 letter by a representative of the Assiniboine Valley Producers Committee, many local people called the government to advise of the heavy snow accumulation in the area, and to recommend releasing additional water from the reservoir to prepare for a large spring freshet, in advance of the flood, knowing that government resources were not in place to do the snowpack monitoring that had previously been routinely done (cf. Appendix H, p.2).

Participants' comments on this issue related to: the seemingly chronic lack of knowledge regarding the amount of snow northwest of Winnipeg; frequent failed attempts to notify Manitoba Conservation (currently Manitoba Water Stewardship) of snow levels and potential flood concerns; mistaken or misguided assurances from the provincial government that the Dam could handle the spring freshets, especially in 1995 (e.g., Appendix L, p.1); and the damages that followed when the water was released via the spillway and when the Assiniboine River was in flood. The participants appeared to realize that the Shellmouth Dam could not have prevented the 1995 flood (i.e., that it was not designed to fully manage such an event) and focussed their comments on the adequacy of flood forecasting, runoff modelling and the associated implications for management of the Dam operation.

The need for better long-term flood-management planning in the area was mentioned specifically; many of the other comments also relate to a perceived current lack of long-term planning. The participants noted the increasing number of competing interests related to the management of flows in the Assiniboine River and levels in the Lake of the Prairies (e.g., flood control; increased downstream water demand; recreation and tourism; agriculture and irrigation, ecosystem health, etc.). They reported their strong belief in the need for both governments to work with all stakeholders to develop an effective long-term plan for the Assiniboine River area that includes long-term demand projections for water and alternative means of supplying water.

4.1.1.12 Decreased Recreation/Tourism

The potential for decreased recreation and tourism opportunities resulting from altering the current surface-water elevation and flooding of the existing shoreline was mentioned 15 times. The meeting scheduled to discuss the proposed Upgrade with local cottage and business owners was attended by nearly 50 people (approximately twice as many as the attendance at most other stakeholder meetings).

Many of the participants were farmers who chose to also attend this meeting. Tetr*ES* noted that this created some risk that recreation and tourism issues were not adequately raised at that meeting. Two members of the Steering Committee met with some concerned recreation/ tourism operators at a later date to remedy this possible deficiency. In addition, these participants used the mail-back cards and phone calls to raise their issues.

Losses to local recreation and tourism developments (flooded campsites, non-compliance with the minimum setback distances to the high water mark, reduced well-water quality and/or supply, erosion, etc.), and the related economic impacts, were some of the main concerns reported at the meetings in Russell and in the majority of all of the mail-back cards and letters received after the meetings.

The owners of Ski Asessippi Ltd. Partnership provided a written record of their specific concerns related to their ski operation. These include: erosion and the stability of the Quad lift with its current rock emplacements; slope stability at the foot of the lift, workshop, daylodge, and southern valley wall; the impact on other infrastructure (e.g., 550-volt power box located on the ground); the interaction between higher river levels and the natural discharge of the aquifer; the placement of existing submerged pipes if river-water levels were consistently higher; the continued use of installations used to access the allocated 10% of river flow (e.g.. for snow making) and the effect on existing conditions related to drawing water; the process for establishing a new high-water mark on leased land; the integrity and use of the wooden bridge across the Shell river (important for future development on the north side of the river and used by the Trans-Canada Trail); and the impact to future development, including additional ski trails (Reavie *pers. comm.* 2003).

The development corporation and tenants of Pyott's West Campground also submitted a letter noting specific concerns related to erosion and lost water supply. The owners advised that the campground would be expected to lose significant overnight camping opportunities and six seasonal sites, resulting in lost direct and indirect (e.g., fishing supplier, boat rentals) revenue if the current water levels were raised by six feet (McIntosh *pers. comm.* 2004).

4.1.1.13 Saskatchewan's Need for Water

The need for water in the Kamsack area and for municipal or industrial development in Saskatchewan was raised 14 times, primarily during the meeting in Kamsack (cf. Appendix I). The rural municipalities and farmers near the Assiniboine River, upstream of the reservoir, were concerned about their domestic and agricultural water needs being consistently met, especially in drought years, if the Upgrade proceeded. The participants of the Kamsack meeting showed interest in such possibilities as building a structure to retain additional water in off-stream storage, and using a pipeline to draw water from the reservoir for domestic use. Participants noted their belief that the Saskatchewan government is concerned about its abilities to licence future wet industries, and to consistently access their 50% allocation of water flowing between Saskatchewan and Manitoba (e.g., Appendix H, p.3; Appendix F, p.2) under provisions of the 1969 Prairie Provinces Water Board Apportionment Agreement (cf. PPWB 2003; see also Section 4.2.2).

4.1.1.14 Dam Safety

The issue of the current safety state of the Dam, and future safety of the Dam assuming a gated Upgrade, was mentioned 11 times throughout the meetings. People reported being concerned about the structural integrity of the dam during the 1995 flood (e.g., Appendix J, p.1). They expressed worry that increasing the capacity of the reservoir to hold more water on a regular basis would result in an increased risk of failure and risk for downstream communities (cf. Appendix H, p.2). The adequacy of the height of the freeboard if the dam included gates was also a concern (e.g., Appendix L, p.2).

PFRA advised these people that a dam-safety analysis, and the development of a dam-safety data book and Emergency Preparedness Plan, are components of the Canada-Manitoba Shellmouth Dam Consolidation Agreement and are planned for completion in summer 2004.

4.1.1.15 General Support for the Project

Comments related to overall support of the project or its goal to increase water availability downstream occurred eight times. These comments were generally made during the Portage la Prairie and Brandon meetings.

4.1.1.16 Desire for Ongoing Communication with the Public

There is a general consensus among the participants in the meetings, that the information gathered during the Scoping Study meetings should be made available to the public. Access to the report and meeting notes via a Project website was suggested at an initial meeting, and eight times in total. This would allow participants in the meetings to verify the existence and comprehension of any issues they raised in the study documentation and to learn about the issues and questions that were discussed by other participants in other meetings. The Steering Committee agree that this would be a useful communication tool that it would consider, and development of a project-specific website was offered by PFRA.

In addition, the participants advised that they would like to be included in ongoing communication with the government and private consultants (e.g., Appendices F, G, H and I). The participants were made aware of the public involvement that would occur during a future EIA process. They stated that this should be an overarching goal for the Upgrade project, and for the long-term operation of the Dam.

4.1.1.17 The Kamsack Farmers' Agreement

Questions relating to the terms and conditions of the compensation agreement reached between the governments and upstream farmers were raised seven times. Downstream farmers who did not receive compensation or the opportunity to sell their land to the government would like access to the terms of this agreement and believe that they are entitled to a similar compensation package (see Section 4.1.2).

4.1.1.18 Increased Recreation/Tourism

The potential for increased recreation and tourism opportunities resulting from improvements in flood control and increased water levels in Lake of the Prairies was expressed six times throughout the meetings (e.g., Appendix M, p.1). These comments related primarily to perceived increases in fishing opportunities that might exist because of a deeper reservoir.

4.1.1.19 Increased Farming Opportunities, Better Access to Water

The opportunity to better control the flow of water on the Assiniboine River to meet the seasonal seeding and land-access needs of farmers that could be achieved through altered operation of an upgraded Shellmouth Dam was seen as a benefit to some downstream farmers. This issue was noted four times during the meetings in Brandon and Portage la Prairie.

4.1.1.20 Risks Due to Climate Change, Evaporation

The potential evaporative loss of reservoir water, considered to be of increasing risk due to climate change, was raised four times (e.g., Appendix H, p.2). The need to include this factor in inflow forecasting, future water-demand projections, and in assessments of the ability to meet these future demands was noted by these participants.

4.1.1.21 Need for Comprehensive Economic Analysis of the Upgrade

Four people questioned or mentioned the need for an economic analysis of downstream needs, future water-demand projections, and the Upgrade to the Shellmouth Dam. It was noted that although the gates may be the most directly cost-effective option (given the existence of the Dam), this might not be the case when all direct and indirect factors are taken into consideration, including environmental, social and economic damages. Respondents linked this issue to both the need for a comprehensive transparent evaluation of project alternatives and to the need for improved long-term flood-management and water-supply planning.

4.1.1.22 Other Issues

Some issues were raised only one or two times but were considered by the participants to be sufficiently important as to be included in the overall environmental scoping. These issues include:

- the potential increase in (and effect of) debris on the reservoir;
- the accuracy and reliability of simulation modelling done to plan the Upgrade;
- the cumulative effects of the operation of the Upgraded Dam;
- the need for the project (i.e., to meet water-demand projections) viz. the potential for significant water-conservation opportunities;
- the value of developing minimum instream flows for protection of fisheries;
- the need for improved predictions of long-term erosion of the riverbanks and the ability to mitigate this impact;

- the need for Aboriginal peoples to be beneficiaries of the Project;
- the loss of the representative voice for the river when the Assiniboine River Advisory Board stopped functioning;
- the need for a fishway in the Upgrade project to protect migratory fish movements;
- the potential for turbine generator on the outflow (i.e., power production); and
- effects on drinking water wells.

The general sentiment of the mail-back cards and letters received after the public meetings was one of frustration and anger. The population living close to the Shellmouth Dam who expressed themselves at, and after, the meetings believed that increasing the capacity of the reservoir to benefit (primarily) users far downstream is "*unacceptable*".

4.2 ISSUES RAISED BY STUDY TEAM

In addition to the issues raised by the public, reviews of the literature, past studies and the experience of the Tetr*ES*/CIER study team also suggested potential issues related to an Upgrade of the Shellmouth Dam that merit attention. In general, the issues focus on hydrogeology, flood protection and control, groundwater, water quality, soil, vegetation, fish, wildlife, local and regional economy, local and regional socio-cultural use of the resources, and heritage resources. Regulatory issues identified by the Study Team (as distinct from those raised by the regulatory authorities, Section 4.3) are also discussed.

Issues raised by the Study Team for future attention should not be interpreted as an indication or assessment of significance. This analysis would (and should most properly) occur during the Environmental Assessment subsequent to this Scoping Report.

No attempt has been made by Tetr*ES* to reduce the "double counting" that arises from the Study Team's identification of issues requiring attention from the public's identification of issues.

4.2.1 General Hydrology

The proposed Upgrade should allow for more predictable downstream flows (as the operating rules evolve and become more publicly understood and relied upon), however the potential for higher minimum in-stream flows in key seasons (i.e., summer) and for increased irrigation use is unclear. Changes to high-water levels in the reservoir and the River could also alter the available land base for private riparian landowners and for First Nation riparian Reserves and/or traditional-use lands.

The anticipated changes to the dam operating rules (e.g., change in the drawdown rate of the reservoir) will likely affect the hydrology in the area, especially downstream. It appears that these potential downstream effects are not currently well understood, and they must be if the province is to develop operating rules capable of being publicly accepted. This will likely be a challenge, given the multiple downstream interests (e.g., minimum in-stream flow requirements viz. fish; downstream domestic, industrial, and agricultural water needs; effluent assimilation; subsistence fishing by Aboriginal peoples).

The possible changes in the “typical” rate of reservoir evaporation due to climate change could result in unplanned water losses and/or changes in the water quality of the outflow. The extent of this potential effect is unknown but such hypothetical losses should be factored into long-term modelling and supply-demand projections (cf. Rosenberg *et al.* 1997), perhaps through an expanded range of sensitivity analyses in the design work being undertaken by the consulting engineers.

The long-term effects of deposition of solids in the reservoir could also result in changes to the water-surface elevations (and the associated impacts on flooding, erosions, water supply, etc.), and/or suitability of the reservoir as fish habitat. Tetr*ES* understands that this was studied in the past and the potential was determined to be negligible, but that the Steering Committee intends to revisit the issue. Tetr*ES* observes that this would likely be helpful to any subsequent EIA process.

4.2.2 Municipal Water and Wastewater

The potential for increased upstream backwater effects, and impaired gravity discharge from sewage lagoons discharging to the reservoir (e.g., Kamsack), are also potential effects of an Upgrade. So too is the potential for enhanced water supply in Saskatchewan (cf. Appendix I, p.1).

The Upgrade could result in effects to industrial or municipal water-supply systems, such as the locations or effectiveness of intakes and/or outfalls, or to current water treatment processes. An increased downstream flow resulting from the Upgrade could create a more consistent supply for downstream needs. Under circumstances not yet clear, communities currently reliant on the Assiniboine Delta Aquifer (ADA) could theoretically become somewhat less dependent on this underground source of water. The ADA is an important water-supply source for 12 RMs having a total population of about 10,000 people (cf. sec. 6.5.2.4) The interplay between some reduced withdrawals from the ADA if more water is available in the river, on the one hand, and more interest from different parties in new withdrawals from the aquifer (because more unallocated resources are made available by other users' decision to draw from the river; e.g., Appendix G, p.2) on the other, is uncertain. Whether or not the Upgrade would have a net negative or positive effect on recharge of the aquifer and the state of its unallocated reserves is unknown at this time.

4.2.3 Flood Control and Protection

An Upgrade to Shellmouth Dam creates the potential for increased downstream flood control and protection of public and private riparian lands and buildings. The geographical extent of this protection is unknown and is debated or queried by the public (cf. Appendix G, p.2). The effects immediately downstream of the dam compared to, for example, the effects near the Portage Diversion are worthy of attention. It has been stated that potential indirect effects of the Upgrade on the Red River Floodway Expansion Project will be minimal, and that potential direct effects will be non-existent. The expected lack of interconnection is worthy of consideration in subsequent studies, and should likely be verified before any subsequent EIA of the Shellmouth Upgrade.

4.2.4 Groundwater

The increase in the upstream water table could create a variety of different issues related to local groundwater regimes surrounding the reservoir. The potential for localized effects of elevated groundwater levels on existing riparian land uses within the existing takeline of the reservoir need to be assessed. For example, an alteration of the seasonal pattern of upstream groundwater levels could increase the potential for, or likelihood of, irrigation of riparian lands (or lands further from the reservoir shorelines) which could increase salinization of these lands (cf. Eilers 1981) and thereby affect the long-term use of such land. An increase in the upstream water table could also result in decreased rates of drainage on upstream lands, which could have implications for existing land use and/or infrastructure. For example, there could be possible softening of municipal roadbeds.

The increased seasonal soil moisture in both upstream and downstream riparian lands could also affect their suitability for cropping. The stability of the downstream Asessippi Ski Hill lift foundations, and decreased bank stability upstream, could also be potential issues arising from elevations of riparian land soil-moisture regimes.

Effects of the project on the Assiniboine Delta Aquifer downstream could vary from negative to positive, depending on the season of the year and the pattern of groundwater withdrawals in relation to upstream water releases.

4.2.5 Soil and Agronomic Issues

There is a possibility of effects on the agricultural productivity of soils subjected to increased soil pore-water concentrations from either elevated groundwater levels or reduced rates of drainage. The linkages between possible changes in groundwater levels and possible changes in soil attributes (e.g., nutrient availability; nitrogen, phosphorus, micronutrient concentrations; change in soil plasticity; increased vulnerability to soil erosion) and the implications for agricultural suitability are worthy of attention. The effects of the proposed Upgrade on farmers' ability to move farm equipment and the potential delays in planting/harvesting may also be issues of concern.

Any changes in irrigation practices within the project area, arising from the perception or fact of greater firm supply of unallocated water, could create both agronomic benefit (e.g., higher-value crops, and higher yields), and agronomic risk (e.g., soil salinization; cf. Eilers 1981).

4.2.6 Water Quality and Fisheries

Impoundments of rivers can rarely be built without some degree of adverse effect on water quality and on the aquatic ecosystem (Rosenberg *et al.* 1997; World Commission on Dams 2000). A preliminary assessment of mercury in the Shellmouth Reservoir, reported in 1990, found methylmercury levels in walleye to be greater than 1.0 ppm, with some samples greater than 2.0 ppm. These values exceed the 0.5 ppm limit for methylmercury concentrations in fish sold for human consumption in Canada (Saunders 1990). Fisheries and Oceans Canada (DFO) suggested at that time that a 10-15 percent increase in area of flooded land on the reservoir would cause methylmercury levels to rise to unacceptable concentrations (Saunders 1990). Accordingly, there is an issue of increased potential for mercury methylation by microbes responding to flooded vegetation and soil. As well, potential may exist for incremental mercury accumulation in the food chain resulting from the Upgrade and the increased capacity of the reservoir (cf. Rosenberg *et al.* 1997). This creates the potential for reductions in benefits from the Lake of the Prairie fishery, and an increment in the current potential risk arising from fish consumption. According to CIER's preliminary conversations with interested First Nations (cf. Appendix E), this is a particular concern of Aboriginal communities who state that they rely on the River for subsistence fishing.

Other parameters of concern related to water quality include potential for elevated nitrogen, phosphorus and total suspended solids concentrations recruiting to the reservoir from land drainage and from leaching from flooded soils, which could affect the health of the downstream River ecosystem. These changes could also result in changes to the assimilative capacity of the River, at least in the upper reaches. By contrast, increased downstream flows could create more assimilative capacity during key seasons (i.e., summer months) for downstream communities (Brandon, Portage la Prairie, City of Winnipeg), if soluble nutrient loads do not increase at the same rate as the increase in available volumes.

An Upgrade to the Shellmouth Dam would likely result in changes to fish habitat and the aquatic ecosystem (Rosenberg *et al.* 1997; World Commission on Dams 2000). Whether or not the net effects would be positive, negative or neutral is unclear at this time, for example:

- a larger, deeper reservoir could increase seasonal fish habitat;
- increased temperature gradients in the deepest waters of the reservoir could result in changes in fish species relative abundance and in fish predator/prey relations; and
- increases in total suspended solids and changes in total suspended solids deposition could result in changes in algal species composition, fish sight feeding, and fish-spawning activities.

More stable summer flows, for example, could create improved habitats, while increased erosion could degrade fish habitat. The net consequence of these individual changes is uncertain.

4.2.7 Vegetation

An increase in the capacity of the reservoir would result in a decrease in and/or relocation of the existing upstream shoreline vegetation. Species composition, including native species, could change around the reservoir margins, in part because of the effects on repeated flooding on soil and pore-water chemistry, and in part because of littoral-zone vegetation clearing practices (an area of public interest as well; cf. Appendix K, p.1). Flooded soils can accumulate phytotoxic compounds (e.g., sulfides, ethanol, soluble iron and manganese) of uncertain persistence, and oxygen deficiencies can cause localized plant toxicity (Kozlowski 1984), suggesting need for evaluation of such risk in subsequent studies if riparian vegetation is to survive in the lands at risk from repeated flooding. Operational rules that result in downstream erosion also create issues of lost/changed vegetation.

4.2.8 Wildlife

A change in the relative abundance of wildlife that is dependent on the current riparian habitats is an issue related to the Upgrade and operating rules. Based on CIER's initial conversations with interested First Nations (cf. Appendix E), this is also one of their concerns, given that many First Nations and Métis people still hunt along the River. There is also potential for an increase in wildlife habitat for waterfowl and mammals dependent on riparian mudflats and wetland vegetation. This could especially be the case through the combination of greater firm seasonal water supply (and its associated assimilative capacity) and the current momentum towards a regional wastewater-management plan, and an associated effluent-pollution-credit trading regime; cf. Tetr*ES*/UMA/WMS 2003), for the Brandon area.

4.2.9 Socio-economic

There are a variety of potential positive and negative socio-economic issues related to Upgrade of the Shellmouth Dam. Downstream, there is the potential for increased irrigation, planting of higher-value crops, development of spin-off agribusiness and increased investment in the Assiniboine flood plains. There is also potential for increased "wet" industry development along the Assiniboine River, especially at Brandon and Portage la Prairie, assuming sufficient increased downstream flows. Downstream water treatment costs may change due to changes in the water quality (e.g., changes in bacterial/algal biomass and bluegreen mycotoxins; cf. Tetr*ES* 1998). Downstream effects closer to the Dam (but possibility as far south as Brandon) may also include a shortened crop-growth period if riparian drainage is incrementally impeded and if seeding of riparian lands is incrementally delayed. This could result in lost riparian-land productivity and income for farmers and increased production costs to accommodate a shorter growing/harvesting season.

The potential need to reconstruct infrastructure, such as bridges and municipal roads is an issue; the economic costs for local rural municipalities could also be substantial although benefits to local construction and service companies could be substantial. Additional forebay shoreline clearing is also possible and has both positive and negative economic implications.

There is a public perception of unequal distribution of past and future Project economic benefits; this can contribute to stakeholder polarization in a subsequent EIA. There is a substantial potential need for additional consultations (pre-EIA) to assist better public understanding of unavoidable Project "trade-offs", especially given the need to improve general public understanding of project operations, decision rules and challenges (cf. Sec. 5.1). Execution of any such outreach appears most favourable soon after the publication of this report, and well before initiation of any subsequent EIA.

4.2.10 Recreation

Issues related to recreation include the possible inundation of current upstream docks/boat launches, the likely need for higher replacement docks/boat launches, and lost upstream beach structures (including Asessippi beach) due to increased surface-water elevations in the reservoir. If not mitigated, such effects would likely create additional costs for cottage owners and business on the lake; simultaneously they create business opportunities for local contractors and vendors. Changes in the reservoir recreational and sport fishery and in opportunities for recreational activities are likely, and the nature of these changes (i.e., positive or negative) is currently unknown. Consequences for downstream river recreation of alterations in Dam operations (e.g., more flows) are unknown but could be sufficient to merit attention in subsequent studies (e.g., "dangerous" canoeing conditions at the "Grand Rapids" downstream of the rail bridge crossing of the Assiniboine River downstream of the Nexen Chemical plant in Brandon, under "high water" conditions; Stefaniuk & Hallgrimson 1979).

4.2.11 Heritage Resource

Negative effects and/or loss of heritage resources are an issue both upstream and downstream of the Shellmouth Dam. The Heritage Resources department in Saskatchewan believes that "*raised water levels would have the potential to impact some sites…in particular EiMk-1 (Fort Riviere Tremblante) and EjM1-1 (cemetery on Cote Indian Reserve)*" (Friesen *pers. comm.* 2003). The Manitoba Heritage Resources Branch (HRB) has stated that "*the potential to impact significant heritage resources is high, and therefore, the HRB has concerns with the project. There are 127 heritage sites recorded in the study area, 14 of which are located on the shores of Lake of the Prairies*" (Hill *pers. comm.* 2004). In both cases, the provincial heritage departments state that a Heritage Resource Impact Assessment should be conducted, perhaps best done as part of the EIA (although it can clearly be done beforehand). Stakeholders have also reported concerns about the potential for heritage losses (e.g., Appendix K, p.1).

4.2.12 Aboriginal Land Claims

According to a database search performed by Saskatchewan Government Relations and Aboriginal Affairs, there are no Aboriginal land claims in the areas potentially affected by an Upgrade (Talbot *pers. comm.* 2004). In Manitoba, a search of the "*Crown Lands Registry indicated 'acquisition lands' of Long Plain First Nation close to the potential study area*" (Stevenson *pers. comm.* 2004). In both cases, these statements are based on the information available to these departments in January 2004.

4.2.13 Regulatory

Regulatory issues are discussed in Section 4.5, and the regulatory requirements for a licensing process are discussed as a component of the EA workplan in Section 6. Local regulatory issues associated with increased capacity of the reservoir include potential non-conformity of existing cottages' minimum setback distances from the high water mark/water's edge as stated in local/regional Development Plans and Zoning By-Laws. This would require political action to "grandfather" existing development found to be non-compliant given the Project effects. Developers with existing land-use plans would also be affected.

There is also a regulatory issue related to the transboundary (inter-provincial) nature of the effects of an Upgrade to the Shellmouth Dam (cf. Appendix I). There is a growing list of issues that are specific to Saskatchewan and a need to satisfy the regulatory processes in this province. The extent of need for an inter-provincial (i.e., joint) EIA regulatory review process is currently unknown and requires attention to assist in defining the regulatory review process that could be required to evaluate the subsequent EIA. The Steering Committee has noted that the Canadian Environmental Assessment Agency (CEAA) would coordinate the EA process (presumable irrespective of whether it is a single provincial or a joint provincial and federal process), as it has for other major current water projects of federal-provincial interest (Wuskwatim Generating Station, Red River Floodway Expansion). The current federal-provincial agreements for cooperative reviews of large water-management projects (e.g., C. Cleroux *pers. comm.* 2003) may offer insight in how such a review process could function for the proposed Upgrade project.

4.3 ABORIGINAL COMMUNITIES AND PEOPLES

The Steering Committee and the Centre for Indigenous Environmental Resources (CIER) met with representatives of six First Nations. Seven other First Nations are interested in participating but were unable to attend. Meetings with Métis peoples occurred as this report was finalized. The results of the First Nations meetings are attached (Appendix E). Reference to this documentation reveals issues specifically of Aboriginal concern or interest, and issues showed with the non-Aboriginal communities, including those noted in sections 4.1.1.1 to 4.1.1.22. The results of the Métis meetings are documented separately.

4.4 ISSUES RAISED BY GOVERNMENT DEPARTMENTS

4.4.1 Manitoba

The Steering Committee met with representatives of relevant Manitoba government departments and recorded issues for inclusion in the Scoping Report. Meetings were also held with the provincial representatives of several federal departments.

Manitoba Transportation and Government Services (MTGS) noted the need to investigate low-lying municipal roads, including the access road to the low level outlet for the Dam and the old PTH 83, also referred to as former Highway No. 31 (there have been slide problems south of the bridge and near the Asessippi Ski Hill on this road). MTGS noted that PTH 83 may be impacted by backwater on the Shell River. It observed that the bridge on PTH 5 and the boat launch at the old Highway No. 5 embankment may also be impacted; and that PR 482 in Saskatchewan has an unstable slope and may be affected by backwater. Regarding potential construction and maintenance work, Tetr*ES* was advised that the Deputy Minister can grant road closures of up to 90 days; longer closures require an Order-in-Council.

Manitoba Conservation provided some initial comments based on the preliminary information available and noted that the potential for impacts on fish, water quality, and shoreline erosions will need to be investigated before or during a subsequent EIA. Other comments include:

- the strong local support for, and interest in, The Lake of the Prairies fishery;
- the opportunity to establish long-term monitoring programs to gather data regarding sediment supply, transport and depositional dynamics, and mercury methylation and biomagnification; and
- the need to consider nutrient monitoring and limited access if new erosion- and nutrient-control measures are to be implemented in riparian areas as a part of any Upgrade impact-mitigation programming.

An inventory of the current land-use permits on the reservoir was recommended by Manitoba Conservation, and it was noted that additional cottage lots are being contemplated. It was suggested that the deeper water on the reservoir could impact existing septic fields and human waste pump-out stations. It was also noted that the safety of unauthorized reservoir access points and pull-off areas (e.g., viewpoints) might be jeopardized. The department also recommended using a bi-annual newsletter for the project to keep the public informed on its progress.

The Manitoba regional office of Fisheries and Oceans Canada (DFO) provided a series of questions and potential concerns regarding fish habitat. In its view, the operation of the Dam will be key to determining the effects on fish habitat within the reservoir and downstream. DFO noted that it would like the province to formalize an operational strategy, where input from DFO would logically be considered during the development of the Dam operating rules. The effects of submerging current riparian areas and further submerging fish habitats, and on spawning grounds was noted as needing to be determined. The locations of spawning grounds (e.g., for walleye, with its significant population in the reservoir), either on the Assiniboine River or adjacent tributaries and streams, are not well known. Potential losses of areas with high light penetration that currently serve as productive feeding areas, would also be a concern to DFO, which also advised that both short-term and the long-term effects need to be determined related to the Upgrade and to changes in the current operating regime. Overall effects on the reservoir, upstream and downstream, need to be evaluated. For example, DFO has interest in whether fish populations could be impacted given that both potential habitat losses and potential habitat improvements can result from the Upgrade, and that reduced winter fish kills (resulting from a deeper reservoir and increased flow in the river) may occur. The net effect of these interacting factors is unknown and, in DFO's view, requires attention.

Navigable Waters permitting viz. bridge clearances is also a federal interest that would require attention before or during a subsequent EIA.

Concerns that were raised by Environment Canada as potential issues included: implications of climate change on the full supply level and downstream water supplies; implications of species at risk in the area (viz. new relevant federal legislation); potential impacts to riparian areas; and potential impacts to water quality in the Lake of the Prairies and the Assiniboine River.

4.4.2 Saskatchewan

The Saskatchewan Highways and Transportation (SHT) department attended the public meeting in Kamsack and expressed geotechnical concerns in later emails. It noted that higher summer target water levels for the reservoir would result in higher levels of standing water against the highway grades in the reservoir areas, potentially resulting in overtopping, washouts, erosion from wave action and softening of the subgrade. It noted that prolonged high levels prior to summer draw down could also negatively affect the subgrade. SHT noted further that current soil levels that relate to government standards for minimum fills above high water level may no longer be adequate. It also noted that if there were to be any increases in spillway crest elevations resulting from the gates, this could also affect the highway grade, although typically the subgrade is frozen during the spring runoff. Nevertheless, overtopping the grade and erosion is a concern. "*Grade raises and armouring of the sideslopes should be considered*" (Skilnick *pers. comm.* 2003).

The Shellmouth Dam was noted to currently affect PR No. 369, which includes a causeway across the reservoir with a bridge in the middle. The following bridges were identified as having potential to be impacted by the project:

- CS 369-01, km 7.97: 192 m long bridge;
- CS 357-01, km 11.36: 3 10.4 m span culverts, top of Roadway 1421.0 ft, crown SSCP culvert 1417.0;
- CS 8-8, km 36.01: 47.3 m long bridge, elevation underside of girder 1424.2 ft;
- CS 8-08, km 36.49: 76.3 m long bridge, elevation underside of girder 1425.75 ft.

To determine whether or not these bridges would be impacted, SHT noted that stage calculations for the elevation of the water at the 1:200, 1:100, and 1:50 flood year period would be required. SHT expects that a change in the forebay elevation of 6.3 ft or higher would have significant impact on the bridges (Skilnick *pers. comm.* 2003).

Representatives from Saskatchewan Watershed Authority and Saskatchewan Environment also attended the Kamsack public meeting. Concerns raised by these agencies included:

- fish habitat impacts, fish passage constraints (not in the current structure) and potential concerns of Fisheries and Oceans Canada;
- the effects of operation, including backwater effects resulting from higher reservoir levels; and
- the effects of the drawdown of the reservoir, given various operating regimes.

The ability to licence developments in Saskatchewan wanting to use water from the Assiniboine River, and the complications associated with water that is in Saskatchewan but stored in Manitoba, were raised. As there is currently no structure in Saskatchewan capable of retaining water, an industry using water would either require the construction of such a structure or access the reservoir. According to the representatives at the meeting, there is currently no demand for this.

Representatives from Saskatchewan Agriculture, Food and Rural Revitalization (SAFRR) also attended the Kamsack meeting. The provincial government owns and administers land below the take-line that is leased to landowners. SAFRR advised that the flood clause has been amended on these leases, and tenants are now contacted in the summer regarding flooding and rents are adjusted accordingly, such that tenants may not pay rent on the land in certain situations. Lease amounts are also increased yearly. SAFRR advised that there is some concern that this approach to land leasing below the take-line is different from the federal lease agreements recently negotiated that are flat fees based on anticipated future situations (i.e., the potential effects of the Shellmouth Dam Upgrade). A consistent approach would likely be more productive for all parties involved. Another concern is the possible decrease in land that could be leased if the Dam were operated at higher water levels.

4.5 REGULATORY ISSUES

On December 10, 2003 a meeting of Tetr*ES*, the Shellmouth Steering Committee and members of the provincial Technical Advisory Committee for water developments was held to provide information to these agencies and record any preliminary regulatory issues (Appendix M). All of the information presented was identical to the information presented at the public meetings.

Questions and comments focused primarily on the potential project description, operation (past and future), impacts to heritage resources, water quality, assimilative-capacities allocated for downstream effluent assimilation, recreational developments, fish populations and species composition. The need to communicate with Aboriginal peoples (First Nation and Métis) was noted. The need to understand all direct and indirect environment effects, including cumulative effects was also noted. The need to protect the licenced access of downstream communities to the assimilative capacity of the river was also noted as important.

5. STUDIES TO ADDRESS DATA GAPS AND DEFECTS IN UNDERSTANDING

5.1 DAM OPERATION

There is a relatively consistent lack of understanding among many members of the consulted public, including the First Nations peoples who met with the Steering Committee and CIER (cf. Appendix E, p.21) of how the Dam is operated (i.e., decision rules), despite the past efforts of the Shellmouth Reservoir Regulation Liaison Committee and prior attempts at public education. Some people also feel that the Dam is operated poorly, without the input of local knowledge, and without sufficient or consistent warnings being issued to downstream riparian landowners and First Nations about imminent major changes in expected flows or levels. Others believe there are, (or believe they see), relationships between the Shellmouth Upgrade project and the operations of other provincial flood- or water-management systems (e.g., Assiniboine Diversion Floodway Expansion, Lockport Dam; cf. Appendix F, p.2; Appendix M, p.1) or U.S. drainage projects like Garrison Diversion or Devils Lake Diversion (e.g., Appendix E, p.25). Still others noted concerns about continuity of access to "their fair share of the water" (and other issues) viz. the decision rules for water apportionment between Saskatchewan and Manitoba (e.g., Appendix F, p.2; Appendix H, P.5; Appendix I, pp.1-2) relied on by the Prairie Provinces Water Board (cf. PPWB 2003).

Operating a dam that was built primarily for water-supply and flood protection but that must now be used to seek multiple additional benefits (e.g., to provide minimum in-stream flows for fish, and to meet industrial and agricultural needs in the Assiniboine River Valley [e.g., Manitoba Agriculture and Food 2001], and recreation and tourism-development needs in the Lake of the Prairie area), has been challenging and will become even more so. The relationships, if any, between this project and other water-management projects adds to the complexity of this challenge, as noted by the stakeholders' comments (e.g., Appendices F and G). The public understanding of this challenge is relatively shallow and demonstrates a substantial degree of confusion with respect to the current and future operational challenges. Additional effort is warranted to enhance public understanding and, potentially, public involvement in future operational programming.

5.1.1 Suggested Activity

One component of the Canada-Manitoba Shellmouth Dam Consolidation Agreement relates to the creation of new Shellmouth Dam operating rules, and there is opportunity before (or during) the EIA to include focus on education related to dam operation. It would also be useful, to achieve both effective operation of the dam in the face of multiple needs and positive public relations about the Upgrade, to include the Shellmouth Reservoir Regulation Liaison Committee in the development and review of these new operating rules, especially if the Committee could be more representative (cf. Appendix H, p.5), as has also been suggested by the public (e.g., Appendix G, p.4). People advise (cf. Appendix G, p.4) that they would like to see additions to the existing Committee to include a representative of downstream farmers and people who spend time on the land and the lake.

Assuming this is done, then the most effective response to this need for greater public understanding would be a public-outreach program, via federal-provincial website, newsletters, "op. ed." articles in newspapers, media releases to rural newspapers, radio [e.g., CBC "Radio Noon"] talk-show appearances, etc.

5.1.2 Suggested Budget

The abovementioned program would be highly cost effective, and should require $5-10K/year for each of 2 years.

5.1.3 Timing

The recommended program is best initiated soon, before the EIA, and should persist through and after the EIA process.

5.2 ALTERNATIVES

There is substantial public interest in the relative merits or disbenefits of alternatives to using gates on Shellmouth Dam to provide increased flood control and to provide for increased future water demands on the Assiniboine River. The public is aware that other infrastructure projects have potential to meet the goals stated for the Upgrade project and that Canada and Manitoba have investigated such options in the past (e.g., Canada-Manitoba 1987, PFRA 1989), and that the province continues to do so (e.g., Manitoba Conservation presentation [PowerPoint] at Simplot Canada Ltd. potato-plant development CEC Hearing). There is also some public interest in the relationship of the Upgrade project to other development alternatives or opportunities, like irrigation or even energy facilities (e.g., Appendix E, p.19; Appendix H, p.1; Appendix L, p.1). This suggests that the issue of alternatives (and linked developments) must be well addressed prior to any EIA that relates to an Upgrade to Shellmouth Dam. Their linkage to public safety and the mitigation of dam-failure risks also needs careful attention.

The current preliminary engineering studies include an investigation of alternatives to gates, including a review of past engineering reports related to additional dam locations. The possibility of controlling water on the Assiniboine River tributaries, on drainage channels, off-stream storage, water conservation and other methods of meeting the flood control and water-demand needs should also be determined. It is not apparent that these studies include focus on other related developments, and this uncertainty must be resolved soon if there is to be any opportunity for the scope of these studies to be practically broadened.

5.2.1 Suggested Activity

Modest but explicit expansion of the current KGS scope of work to ensure credible characterization of candidate design and operational options may be needed and to address the question of potentially linked development alternatives. This is practical and possible, given KGS' role in the current Winnipeg Floodway Study. Results should be made publicly available for considered public review in advance of the initiation of the EIA process. The results of the expanded studies could be included in the outreach program described in Section 5.1.1 above.

5.2.2 Suggested Budget

Expansion of the existing KGS scope of work to address potential project interconnections should be cost-effective, and should require only $10-20K.

5.2.3 Timing

Such work is best initiated now, announced as this scoping report is made public, and is needed for public release before the EIA is initiated.

5.3 DOWNSTREAM ISSUES

A nominal amount of $100,000 has been allocated to studying the downstream impacts of the Shellmouth Dam, as a part of the $8 Million Canada-Manitoba Shellmouth Dam Consolidation Agreement. The Consolidation Agreement (Engineering Services contract No. 2, item 2c) includes provisions for study of downstream issues (direct "hydraulic impacts"). Given the range of downstream issues, their apparent magnitude, and the apparent extent of frustration among downstream landowners and residents, and given the focus in Engineering Services Contract No. 2 on direct hydraulic impacts, it is possible that additional depth of study could be required to facilitate the completion of a successful EIA. Additional efforts appear needed to either fully study the complete range of downstream issues reported to be of concern to the downstream constituencies, or to ensure sufficient public communication of the findings of these studies to, and their acceptance by, these publics (or both).

Regarding compensation for past damages, in particular the 1995 flood, many downstream landowners claim that they were negatively impacted and unfairly denied compensation. The recent compensation agreement with landowners in the Kamsack flats area has drawn attention to this long-standing issue and provided an example of the content of such an agreement. The validity of the downstream claims needs to be investigated, possibly including detailed environmental impact studies. The geology of the project area, for example, is not well understood; Tetr*ES* understands that it was an unknown geological feature in Saskatchewan that resulted in the unanticipated negative impacts in that area.

5.3.1 Flood Regime

Anecdotal evidence provided by the public (and early project documents; e.g., Barber 1978) suggests that flooding on the Assiniboine River prior to 1970 and the construction of the Dam consistently occurred early in the spring. Tetr*ES* is advised that farmers' fields were typically inundated for a relatively short period of time, when the ground contained frost, prior to seeding. Since the construction of the Dam, Tetr*ES* is advised that spring flooding now occurs later in the season and that water consistently remains on the land for a longer period of time.

Notwithstanding that the Dam was not built to prevent a flood of the magnitude of a 1995 event, the people downstream of the Dam maintain that they have experienced more damages because of the Dam than if this large flood had occurred "naturally". Although the Dam withheld the peak of the flood, many people noted that water remained on their land for more than eight weeks, which they believed was much longer than would have been the case in what is referred to as a "normal flood". Figures 4-1 to 4-3 illustrate the effect of the 1995 flood, as provided to Tetr*ES* by local landowners who attended the public meetings.

The effects of the Dam on the recent flood regimes, and the effect of these altered flooding regimes, are not well researched or documented (although anecdotal information is available in the Assiniboine River Basin Study 2000) and these issues are included in the Engineering Services Contract No. 2 study of downstream issues.

The Steering Committee has publicly noted that these issues will be included in the scope of the subsequent EIA.

5.3.2 Erosion

According to the public, the riverbanks of the Assiniboine River downstream of the Dam have experienced more severe erosion since the Dam was built. Erosion was noted by Tetr*ES* during the field visits. Local comments received during the public-consultation process suggest that, at times, the surface-water levels in the river have dropped dramatically in a relatively short period of time. Changes in the water levels on the reservoir have also apparently resulted in accelerated downstream erosion (cf. Appendix L, p.1). Past operational decisions have resulted in greater-than-"normal" riverbank losses and increased bank instability. Downstream vegetation, trees and fencing are reported to have been lost (cf. Appendices J, K, L). The altered downstream flood regime and increased surface water elevations throughout the spring resulting from the management of the Dam may be resulting in increased erosion effects. Many of the landowners offered to provide a tour of their riverside land to demonstrate those effects. The new operating rules could have a significant effect on the water levels in the River, the control of the outflow from the Dam, and therefore on erosion.

An understanding of the "natural" erosion effects of the River and seasonal flooding (i.e., before 1970), as compared with the current erosion, should be included in the recommended characterization of downstream issues. More information (gathered through various methods, including field visits) on the current (i.e., pre-Upgrade) state of erosion and potential effects of the Upgrade is required.

Because private land, and use of the land, has been lost due to erosion, the public consider these impacts as part of a broader impacts-compensation issue. It is therefore important to determine whether or not the existence and operation of Shellmouth Dam has accelerated the natural process of riverbank erosion. These understandings would be required for a competent Environmental Assessment to determine the effects of an Upgrade of the Shellmouth Dam.

5.3.3 Suggested Activity

The most needed activity is sufficient study and public outreach to help downstream parties at interest to better understand the differences in the risk environments upstream and downstream of the Dam since its construction. This could involve specific local studies to characterize local vulnerabilities to flood scenarios. The Committee is addressing a number of these questions in parallel studies (e.g., Service Contract No. 2 re: topographic mapping and satellite-imagery analyses, useful for land-use, aquatic vegetation and terrestrial vegetation studies, etc.) which may prove to be very helpful in addressing this issue. In any event, the success of such studies would likely depend heavily on a measured process of public discussion and education. Of great additional value would be effort to seek consensus around proposed operational changes apparently able to respond to some downstream concerns. Guidance from the relatively successful upstream compensation program may be useful in the design and implementation of a downstream consultation process.

5.3.4 Budget

While very difficult to estimate, the value of protecting a budget of $20-40K is suggested to expand the current KGS scope of work.

5.3.5 Timing

The process would be best initiated now, announced as this report is made public, and should be completed for public release before the EIA is initiated.

5.4 DRAINAGE

Although any issues of non-Project drainage are outside the direct scope of this study, landowners downstream of the Dam have repeatedly stated their belief that rapid, increased rates of land drainage since Dam construction have affected the water levels in the Assiniboine River, and downstream flooding dynamics, water quality and erosion. Some attendees report concerns (as they have at the Open Houses for the simultaneous Floodway Expansion Project EIA process) that major upstream USA projects that will affect the Assiniboine, and the Red River systems (Garrison and Devils Lake Diversions) will add to the drainage loads that the Shellmouth Project must be designed to take account of. The Project (and this Scoping Study) is largely focused on the Assiniboine River in the vicinity and downstream of the Dam, however it is a part of a larger watershed system. The contextual importance of this watershed system needs to be included in subsequent project-specific assessments of incremental changes the Upgrade may cause in Dam infrastructure or operations. The interaction between pre-existing watershed dynamics (e.g., runoff rates) and the project's effects on these dynamics (e.g., changing the rates of runoff) will require attention if downstream farmers' concerns are to be addressed. Focus on these interactions in subsequent studies, including the EIA, will aid identification of the magnitude of incremental changes in the behaviour and health of the river, and its general social, cultural and economic importance.

5.4.1 Suggested Activity

Consideration of drainage issues in the EIA of the Upgrade must be specific to potential impacts on Shellmouth Dam. The challenge is to facilitate stakeholder understanding that the issue may extend beyond an appropriate scope of assessment in the EIA. It will be necessary to assess the potential impacts of increased upland drainage on Shellmouth Dam operations to the extent possible, but it should not be necessary to address the larger general issue of regulation for runoff management in the upland areas of the watershed. Because the issues reported by the public go beyond the Dam Upgrade Project, the following approach is recommended:

- analysis and application of the drainage issue as it impacts Shellmouth Dam operations, through consultation with provincial water managers (hydrologists, regulators), and if appropriate through additional study of the issue by consulting engineers (hydrologists) currently undertaking preliminary engineering, possibly by using simulation modelling. It will be necessary to define potential impacts on Shellmouth Dam operations to the extent possible given current knowledge and technology. If the extent of impacts to Shellmouth Dam operation can be defined and are benign or if operational measures can be proposed to mitigate, additional study beyond expert consultation with water managers may not be necessary. If it is determined that drainage has a significant impact to operations, but the current state of knowledge is insufficient to define the extent of impacts and mitigation, it will be necessary to undertake additional studies. This might entail creation of a model of drainage patterns, upon which simulations of Post-upgrade River regimes can be imposed. Apparent changes in runoff-rates could then be simulated, evaluated and graphically illustrated for subsequent public discussions; and
- building understanding of the larger basin-wide drainage issues and impacts, through consultation with provincial water managers (hydrologists, regulators, other local officials), and through relaying said understanding and ongoing related study and regulatory activities to the public by the environmental consultant engaged to conduct EIA. This will serve two purposes. The first would be to clarify issues which are beyond the scope of the proposed Upgrade. The second would be to educate the public on the current state of affairs and

work being undertaken by the responsible regulatory authorities in the area of drainage management.

PFRA and Manitoba Water Stewardship should maintain an appropriate degree of attention on the drainage issue in the EIA, relying on the current available data to address project specific issues, while moving beyond the EIA to seek better understanding of the runoff issue and relaying same to the public.

5.4.2 Budget

Analysis and application of the drainage issue as it impacts Shellmouth Dam operations, through consultation with provincial water managers (hydrologists, regulators) would have no cost implications. If it is necessary to undertake additional study of the issue by consulting engineers (hydrologists) currently undertaking preliminary engineering, possibly by using simulation modelling, costs cannot be accurately predicted. However, it would be prudent to budget for this work notionally, in case the need arises, in the order of $25,000.

For building understanding of the larger basin-wide drainage issues, the costs would be shared among various government agencies participants. Information compilation and communication activities would be undertaken by the EIA consultant. It would be prudent to budget for this work under the EIA at approximately $25,000.

5.4.3 Timing

On drainage issues which may impact Shellmouth operations, the commitment to address project-related drainage issues requires immediate attention. The ability to present information to the public on project-specific effects and possibly mitigation should be well established during EIA.

On basin-wide drainage issues, early initial information gathering would ensure that sufficient information is available for analysis in the EIA.

5.5 WATER QUALITY

Current water quality on Lake of the Prairies and Assiniboine River is reportedly considered "poor" by many of the local population. Potential changes to the water quality due to an Upgrade, or any of the design or operational alternatives, should be studied, including consequences of raising the height of the water column, changes in the hydraulic retention time, and changes in sedimentation dynamics. The opportunities to improve/protect water quality (and, potentially, fisheries and river recreation) via off-line storage and upstream riparian management should be determined and pursued, if deemed useful. This appears especially feasible through the vehicles of existing federal and provincial programming, and such programs as conducted by conservation Districts and Ducks Unlimited.

As well, the possible changes in the "typical" rate of reservoir evaporation due to climate change could result in unplanned water losses and/or changes in the water quality of the outflow, a potential requiring further study.

5.5.1 Suggested Activity

It is necessary to integrate all of the available data describing the current water quality (e.g., Gurney and Fortin 1992, Fortin and Gurney 1997, Dillon Consulting 1998), limnological characteristics (e.g., Gurney and Jones 1997), presence of chemical contaminants (e.g., Gummer 1979), and primary and secondary productivity of Lake of the Prairies. The combined dataset could greatly improve the focus in the subsequent EIA, by helping to frame testable hypotheses about expected effects of the changed structure and functioning of the reservoir. Some focussed water-quality sampling would likely be required to augment the historic water quality dataset. The extent of the potential effect of climate change should also be factored into long-term modelling and supply-demand projections, perhaps through an expanded range of sensitivity analyses in the current parallel engineering studies.

If the abovementioned runoff-rate monitoring (cf. Section 5.4.1) is to be done, the incremental effort and cost of simultaneous sampling of the runoff, and the adjacent reach of the river, could be modest. This would allow creation of a specific database for describing runoff quality, and for estimating loads to the littoral zone of the river in selected reaches. The incremental change in river littoral-zone and mainstem water quality could then be estimated using simple spreadsheet models and the existing water-quality databases for selected reaches of the river. The literature and local experience with upstream off-line storage and runoff management on riparian lands could also be reviewed to define the probable effectiveness of such impact-management measures for water-quality protection. Pilot projects with multi-stakeholder involvement and cost sharing could create much dissemination of useful knowledge, and genuine contributions to water-quality improvement, for modest investment.

5.5.2 Budget

The costs to acquire, incorporate and distill interpretative statistics from the available historic water-quality databases are estimated to be $20-40K. The major cost for supplementary water-quality analyses is primarily related to water chemistry analyses of runoff and river littoral zone sampling (assuming that the commitment to runoff-rate monitoring has already been made). An incremental budget of $10-20K would be needed, in this scenario, for the supplementary testing, for a total of $30-60K. No cost estimate is provided for additional sensitivity analyses to address climate-change uncertainties, because this should not require additional costs if added into the current hydrology/engineering studies. The costs to build networks of stakeholders to be involved in off-line storage and riparian management, and to design, support and monitor selected regional pilot projects, is estimated at $75-150K.

5.5.3 Timing

The water-quality data analyses are needed before the EIA process begins. The pilot-project concepts, performance targets, performance-evaluation criteria, and candidate stakeholder participants in these projects, must be in view and the projects themselves initiated during the EIA, such that the expected effectiveness of the pilot projects can be available as context to the potential impacts being evaluated in the EIA.

5.6 AQUATIC ECOSYSTEM AND HUMAN-HEALTH RISK ASSESSMENTS

The effect of an Upgrade to the Shellmouth Dam and the increased water volumes in the Lake of the Prairies and the Assiniboine River on fish habitat must be well understood. For example, regulators (e.g., DFO; cf. DFO 1992), sport fishers and recreationists (e.g., Appendix G, Meetings No. 2 [p.1] and 4 [p.1]), and First Nations (e.g., Appendix E, p.22) have expressed interest in whether fish populations could be impacted, given that both potential habitat losses and potential habitat improvements can result from the Upgrade, and that reduced winter fish kills (resulting from a deeper reservoir and increased flow in the river) may occur. This issue requires further study. Any effects to the fish populations in the Lake would likely also have economic effects (either positive or negative), given the popularity of the sport fishery. This would likely be a major economic, environmental, social and cultural issue in the subsequent Environmental Assessment.

In addition, there is residual uncertainty regarding the current ecological consequences of the identified methylation of mercury in the reservoir (Saunders 1990). The degree of biomagnification of mercury in the Lake of the Prairies food chain (cf. Bodaly *et al.* 1986), and the aquatic ecological risk, is unknown, as is the risk to human health from people dependent on this resource (e.g., Aboriginal peoples; cf. Appendix E, p.17), or others who have less consistent exposure to contaminated fish. Further, it is uncertain whether an Upgrade to the Dam (and resulting increase in the size of the reservoir, and increased potential for downstream flows) would create net risk or benefits to downstream fish populations and fish habitats. More stable summer flows, for example. could create improved habitats, while increased erosion could degrade fish habitat. The net consequence of these individual changes is uncertain.

Lastly, the extent of need for site-specific studies to gather information about *Manitoba Endangered Species Act* (MESA) or Committee on the Status of Endangered Wildlife in Canada (COSEWIC) listed species, to ensure sufficient information is available to reassure federal and provincial departments concerned with rare, threatened or endangered (RTE) aquatic or riparian species, is uncertain and needs resolution.

5.6.1 Suggested Activity

Whereas some data are available on the sport fishery, and some limnological data exist, relatively few data are available describing Lake of the Prairies as an integrated aquatic ecosystem. In particular, while some generalized regional data exist (cf. Table 6-5) there appear to have been no systematic studies for rare, threatened or endangered species within the specific study area. As well, while there are data describing mercury concentrations in fish, the degree of ecological risk posed from mercury methylation is not described, and requires to be.

Once a comprehensive dataset on the Lake ecosystem is assembled, additional and selective sampling of components of the aquatic ecosystem not yet tested for mercury content should be undertaken. Attempts to identify aquatic and/or riparian RTE habitats and species could be simultaneously undertaken. For ecosystem biomagnification sampling, emphasis should be given to piscivorous (i.e., fish-eating) birds or mammals. The degree of occasional, or regular, dependence on the domestic fishery should be established, likely using a simple survey technique. Consultations with Aboriginal peoples, in particular, would be required to determine their extent of dependence on fish harvested in the domestic fishery. All of the foregoing information could then be integrated in preliminary human health and ecological risk assessments that would provide critical input data to the subsequent EIA. These assessments would provide most useful content to, and would require input from, the suggested processes for public outreach, consultation, and discussion.

Studies of downstream fisheries, populations and habitats to integrate historical information, and the results of the current federal-provincial in-stream minimum flow studies, would be very helpful.

5.6.2 Budget

The major costs for this activity would consist of tissue sampling for a variety of aquatic components, including fish-eating animals and mammals, field inspections for RTE habitats and species, and the completion of the risk assessments. Costs for the former activity could be minimized by "piggybacking" this sample program on top of the Lake water-quality and sedimentation studies previously proposed. Nonetheless, the costs required for undertaking such an analysis of ecological and human risk can be substantial. A budget in the amount of $50-90K is proposed.

The costs for integrating current information about fisheries, populations, habitats and seasonal in-stream flow requirements is estimated to require an additional $20-15K.

5.6.3 Timing

Such research should be undertaken before completion, likely before initiation, of the Environmental Impact Assessment.

The need to minimize costs suggests the wisdom of "bundling" as many field-sampling activities together as is possible, to minimize mobilization/demobilization costs and to maximize efficiency of data gathering. Accordingly, the timing of this activity would relate to the timing for the other water chemistry and water-sediment sampling previously identified. This would suggest that the basic field work would be done over the course of the summer, with the ecological and human-health risk assessments being completed in the fall of 2004. The public and Aboriginal consultations that the risk assessments both initially depend upon, and then later feed information to, would best be completed before the initiation of the EIA.

5.7 COMPREHENSIVE ECONOMIC ANALYSIS

A comprehensive economic analysis of the potential Upgrade of the Shellmouth Dam, including the compensation costs that would be required (e.g., if boat launches and campsites, for example, had to be relocated, as a component of Project mitigation; cf. Bergmann-Baker *et al.* 1995) should be completed to develop the most thorough examination of costs possible. This is being requested now by some stakeholders (e.g., Appendix K, p.2). According to the Steering Committee, the Upgrade currently appears to be the most economical option, given the pre-existence of the Dam. A "full-cost accounting method" of the preferred solution that incorporates the environmental, social and economic costs (cf. IISD 1996, Gregory and Slovic 1997) should be used to assure the various publics that the impacts of the Upgrade have been thoroughly assessed and that a comprehensive approach to impact-mitigation can be developed. Such analyses should take into consideration historic (e.g., Barber 1978) and more recent information (e.g., Shewchuk 1999, ARMAB 1995) in evaluating the broadest possible range of costs and benefits, especially in considering the mitigability of potential impacts and the potential reduction of damages, and compensation costs.

Large-scale public water-management projects are increasingly controversial, and consideration of "alternatives", "alternative means" and "time costs" is increasingly demanded by special interest groups. Projects recently reviewed by the Manitoba Clean Environment Commission have been scrutinized by funded intervenors who have frequently lamented the absence of "full-cost accounting" on such projects. It would be in the Steering Committee's substantial interest to satisfy itself that a sufficiently thorough accounting of the projects costs and benefits had been completed after the EIA was commissioned but before the project was committed, and that all indirect projects impacts were sufficiently well understood that impact-management measures could fully mitigate potential local economic and other impacts.

5.7.1 Suggested Activity

An independent consulting economist should be hired with a view to the completion of a thorough full-cost accounting of the project, based on the recommended design/operation solution. The accounting should take into consideration beneficial and adverse changes to riparian land uses, riparian structures and their value, implications for enhancement, or decline, of the commercial fishery, and the domestic and sports fisheries, and the quantifiable benefits associated with enhanced downstream water supply, increased seasonal availability of assimilative capacity, and enhanced floodproofing and flood avoidance. The results of the analysis will be of high public interest, and will, of necessity, require to be directed to a broad range of audiences. A substantial community outreach process would therefore be useful, and this should be undertaken by the Steering Committee.

5.7.2 Budget

The budget that would likely be necessary for such a study would be substantial, likely in the range of $75-100K.

5.7.3 Timing

Because many of the input data needed for such an accounting require prior determinations and conclusions by the Consulting Engineers and the EIA Study Team, the study should not be initiated until completion of the EIA.

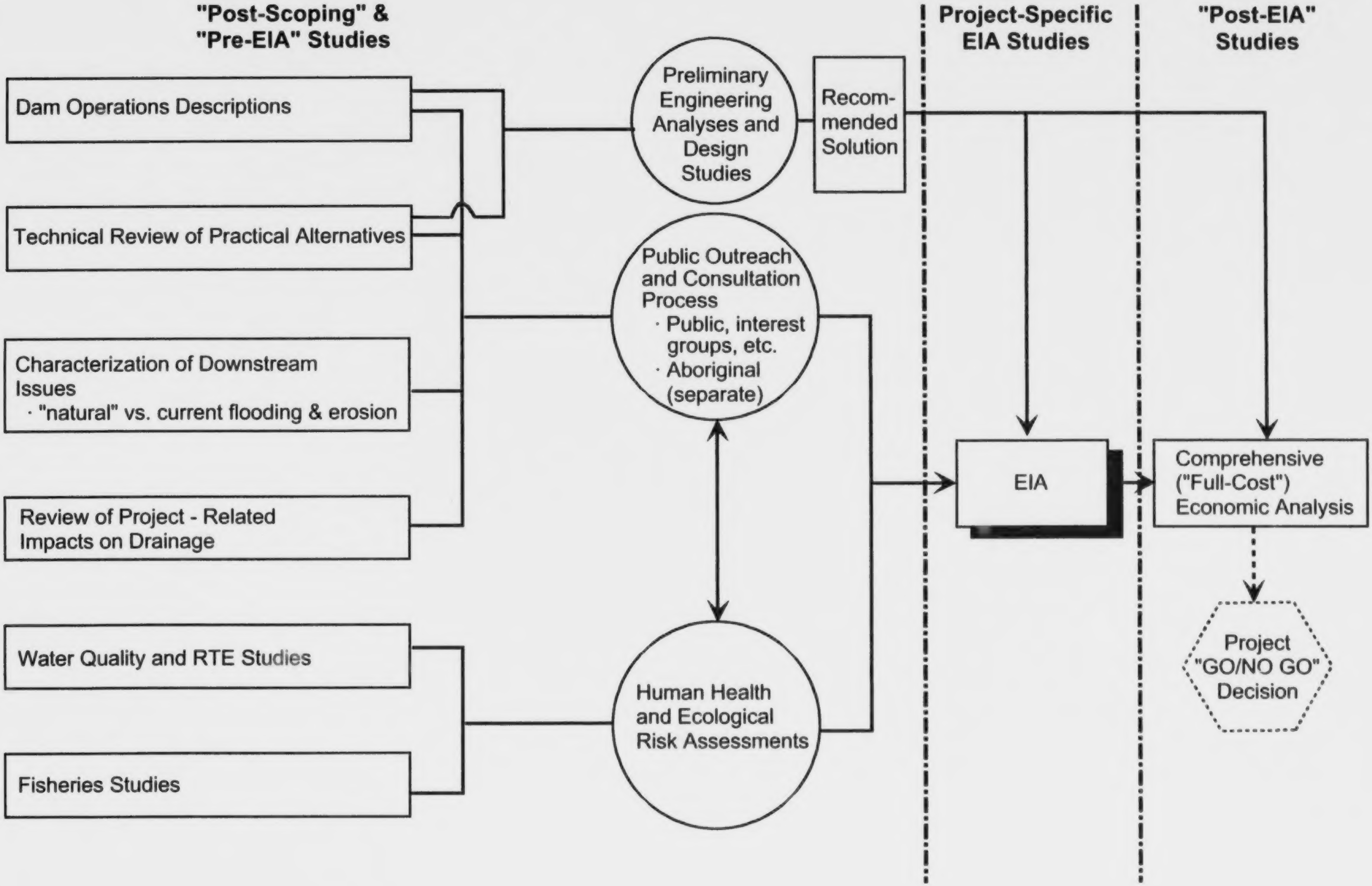
5.8 RELATIONSHIP TO SUBSEQUENT EIA

A conceptual relationship among these recommended studies, and to the EIA study process, is provided in Figure 5-1. Only one recommended action should follow the EIA, and all others would be most effective and helpful to the success of the EIA, if completed before it was initiated.

5.9 STUDIES BUDGET

It is not possible to provide a precise cost estimate on the program of pre- and post-EIA studies needed to fully respond to the issues raised and encountered in this Scoping Study.

Consideration of the content of Section 5 suggests a range of costs of $325K to $585K may be prudent (cf. Table 5-1). Tetr*ES* suggests that it would be appropriate to protect a minimum study budget of $390K (excluding GST) for these EIA-supporting studies.


"Post-Scoping" & "Pre-EIA" Studies
Project-Specific EIA Studies
"Post-EIA" Studies
Dam Operations Descriptions
Technical Review of Practical Alternatives
Characterization of Downstream Issues
· "natural" vs. current flooding & erosion
Review of Project - Related Impacts on Drainage
Water Quality and RTE Studies
Fisheries Studies
Preliminary Engineering Analyses and Design Studies
Recom-mended Solution
Public Outreach and Consultation Process
· Public, interest groups, etc.
· Aboriginal (separate)
Human Health and Ecological Risk Assessments
EIA
Comprehensive ("Full-Cost") Economic Analysis
Project "GO/NO GO" Decision

Conceptual Sequencing of Pre-EIA, EIA, and Post-EIA Studies
Figure 5-1

studies
ms\01\0211\09

TABLE 5-1

COST ESTIMATES FOR EIA-SUPPORTING AND EIA-DEPENDENT STUDIES*

	POSSIBLE COST RANGE	SUGGESTED NOMINAL BUDGET
Dam Operations	$10-20K	$15K
Review of Alternatives and Potential Project Interconnections	$10-20K	$15K
Review of Downstream Issues	$20-40K	$25K
Drainage	$25-50K	$25K
Water Quality and Riparian Management	$105-210K	$150K
Fisheries and Health Risk Assessments	$70-105K	$85K
Comprehensive Economic Analysis	$75-100K	$75K
TOTALS	**$325-585K**	**$390K**

* Note: It is acknowledged that some of these studies can be undertaken within the framework of the subsequent EIA, so long as their results are available to the EIA consultant before the EIA process concludes.

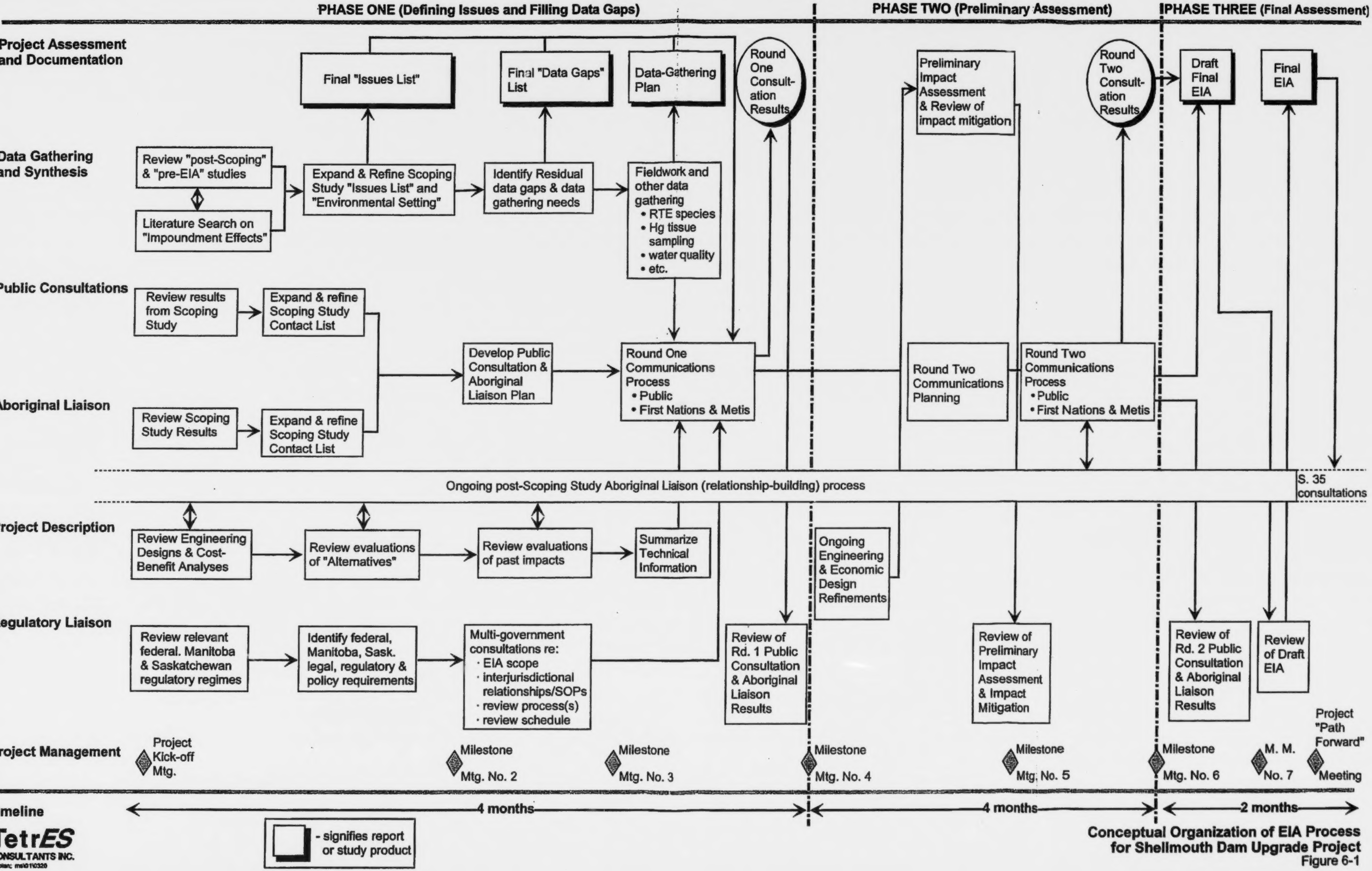
6. EIA WORKPLAN

The results of the Environmental Scoping Study and the parallel Preliminary Engineering Studies will be used by the Steering Committee to determine the feasibility of the Project and, should it be feasible, to develop a Project intended to be licensed by Manitoba Conservation and approved by a federal Responsible Authority(s).

The attached Figure 6-1 provides a conceptual view of an appropriate organization of the EIA processes in consideration of the issues raised in this Scoping Study, and the uncertainties identified, in particular, in Section 5. As noted in Figure 6-1, the EIA process should consist of at least seven workstreams, organized in at least three phases, having a logical conceptual schedule of at least 10 months. The initial phase would be intended to define issues for attention in the EIA as succinctly as possible. In addition, Phase 1 would include identification of all datagaps capable of constraining the successful completion of the EIA, and actions for resolution of these uncertainties. In Phase 2, a preliminary assessment would be undertaken, including focus on how benefits of the Upgrade could be enhanced, and how the projected impacts could be mitigated. In Phase 3, the assessment would be finalized, with a view to shifting the project forward in terms of both ongoing relationships with Aboriginal peoples, and other activities necessary to complete the project (e.g., design finalization, procurement, etc.).

Reference to the attached Figure 6-1 will indicate that the proposed EIA process has a number of features, including:

- an emphasis on producing public documents for review on a systematic and sequential basis during the study process, beginning with an initial listing of issues, and data-gaps, through to the documentation of discrete rounds of public consultations;
- a substantial focus on public consultations for refining the scope of the EIA, refining the notion of initial public contacts arising from the Scoping Study, and for reviewing preliminary assessments and concepts of impact mitigation;
- maintenance of a separate discussion process for Aboriginal peoples (i.e., both First Nations and Métis peoples) linked to (but maintained separate from) the general public-consultation process needed to satisfy relevant provincial and federal statutes;
    - it is important to note that the conceptual EIA Workplan presumes that the Steering Committee will maintain the current separate Aboriginal-liaison process developed


PHASE ONE (Defining Issues and Filling Data Gaps)
PHASE TWO (Preliminary Assessment)
PHASE THREE (Final Assessment)
Project Assessment and Documentation
Final "Issues List"
Final "Data Gaps" List
Data-Gathering Plan
Round One Consultation Results
Preliminary Impact Assessment & Review of impact mitigation
Round Two Consultation Results
Draft Final EIA
Final EIA
Data Gathering and Synthesis
Review "post-Scoping" & "pre-EIA" studies
Literature Search on "Impoundment Effects"
Expand & Refine Scoping Study "Issues List" and "Environmental Setting"
Identify Residual data gaps & data gathering needs
Fieldwork and other data gathering
• RTE species
• Hg tissue sampling
• water quality
• etc.
Public Consultations
Review results from Scoping Study
Expand & refine Scoping Study Contact List
Develop Public Consultation & Aboriginal Liaison Plan
Round One Communications Process
• Public
• First Nations & Metis
Round Two Communications Planning
Round Two Communications Process
• Public
• First Nations & Metis
boriginal Liaison
Review Scoping Study Results
Expand & refine Scoping Study Contact List
Ongoing post-Scoping Study Aboriginal Liaison (relationship-building) process
S. 35 consultations
roject Description
Review Engineering Designs & Cost-Benefit Analyses
Review evaluations of "Alternatives"
Review evaluations of past impacts
Summarize Technical Information
Ongoing Engineering & Economic Design Refinements
egulatory Liaison
Review relevant federal. Manitoba & Saskatchewan regulatory regimes
Identify federal, Manitoba, Sask. legal, regulatory & policy requirements
Multi-government consultations re:
· EIA scope
· interjurisdictional relationships/SOPs
· review process(s)
· review schedule
Review of Rd. 1 Public Consultation & Aboriginal Liaison Results
Review of Preliminary Impact Assessment & Impact Mitigation
Review of Rd. 2 Public Consultation & Aboriginal Liaison Results
Review of Draft EIA
roject Management
Project Kick-off Mtg.
Milestone Mtg. No. 2
Milestone Mtg. No. 3
Milestone Mtg. No. 4
Milestone Mtg. No. 5
Milestone Mtg. No. 6
M. M. No. 7
Project "Path Forward" Meeting
meline
4 months
4 months
2 months
- signifies report or study product

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Conceptual Organization of EIA Process for Shellmouth Dam Upgrade Project
Figure 6-1

during the Scoping Study, in particular to facilitate input into the parallel review of engineering alternatives and other pre-EIA studies recommended in Section 5 of this Scoping Report;

  - it is also noteworthy that this process is expected to immediately shift into a formalized government-to-government process of formal consultations with Aboriginal peoples once the EIA is released, if the potential for infringement of an Aboriginal right or entitlement is identified in the subsequent EIA;

- a substantial dependence upon a thorough review of engineering alternatives and options for alternative means of Dam operations being in place well before the initiation of the EIA, and that this process included substantial public involvement;
- a substantial reliance upon sequential consultations with the regulatory staff in both Saskatchewan and Manitoba, with a view to developing clear expressions of their respective regulatory-review process requirements and, hopefully, consensus that a single "cooperative review" process can be structured for the Upgrade; and
- a series of "milestone" meetings with the Steering Committee, approximately eight in number over the course of the 10-month EIA, organized around the review of major deliverables or key study decision points.

6.1 STUDY AREA AND BOUNDARIES FOR EIA

6.1.1 Geographic Scope

The potential geographic scope of the project should include the entire length of the Assiniboine River between Kamsack, SK and the City of Winnipeg. It should include potentially affected Aboriginal lands. There was significant commentary during the public meetings at each location along the river suggesting that this breadth is necessary. From an environmental perspective, the geographic scope for the EIS should consider using the watershed as a base, wherever feasible.

Upstream of Highway No. 16, in the area known as the "Upper Assiniboine Basin", the geographic scope discussed and proposed by the participants generally involved the basin as a whole, taking into account relevant land uses, farming practices, land drainage, and related lake, river, creek and surface management activities and their complex interaction with atmospheric, surficial and subsurface environmental dynamics and ongoing changes in the area.

Downstream of Highway No. 16, the issues raised were generally more focussed on the Assiniboine River itself, in terms of flows (both flood and drought) and the interaction with existing socio-economic (irrigation, traditional land use, fishing, etc.) and biophysical features (water quality, biotic populations, contaminates, etc.).

Preliminary consideration of the public's and Aboriginal reported issues suggests that the Upper Assiniboine Basin should be the subject of a relatively broad Cumulative Effects Assessment within the EIA with respect to the complex interaction of the area's human activities on the area and as they relate to the project. The issues raised suggest that downstream of this general area, the scope of the EIA should focus more on water quality and availability (in both flood and drought, from both surface and subsurface [e.g., Assiniboine Delta Aquifer] sources) and the related issues of the cumulative effects of water use (both in river and surrounding groundwater) and related biophysical (wildlife, fish, plants, etc.) and socio-economic effects.

6.1.2 Temporal

The temporal scope for the EIA should extend sufficiently backwards in time to cover the historical operations of the Dam (e.g., past 10 years) so as to create the current context and baselines for the assessment of Upgrade effects. It should extend sufficiently far into the future that a credible Cumulative Effects Assessment can be made (e.g., 10 years).

6.1.3 Administrative and Regulatory

As noted in Sections 6.2.1 to 6.2.4 following, the administrative regimes and regulatory processes of Manitoba, Saskatchewan, Canada, First Nations and Métis peoples are implicated by the proposed Upgrade. As discussed further below, the administrative and regulatory processes requirements must be considered in the design of the EIA and its schedule. Some of the complexities requiring attention in doing so are outlined in Sections 6.2.4.1 and 6.2.4.2.

6.2 REGULATORY FRAMEWORK

Any future Project-specific EIA report will contain the final statement of the appropriate elements of the regulatory framework. An understanding of the Project Scope based, in part, upon a finalized Project Description is necessary to ensure all regulatory requirements are met. At this time, the central elements of the regulatory framework, which would likely create the major contextual elements for scoping the assessment of an Upgrade to the Shellmouth Dam, are noted below, grouped by jurisdiction.

6.2.1 Manitoba Provincial Acts and Regulations

All developments in Manitoba that have the potential to affect air, land, or water require licensing under the provincial *Environment Act*. The provincial *Sustainable Development Act* also applies to this Project, insofar as it requires analysis of the long-term environmental sustainability of a proponent's operations.

The particular provincial *Acts* and regulations that are of greatest relevance are:

- *The Environment Act* (S.M. 1990, c.26, C.C.S.M. E125) and associated regulations including:
  - Classes of Development Regulation (M.R. 164/88R).

- *The Sustainable Development Act* (S.M. 1997, c.61, C.C.S.M. S270).

- *The Heritage Resources Act* (R.S.M. 1987, c.H39.1)
  - Heritage Sites Designation Regulation (M.R. 122/88R).

- *The Planning Act* (C.C.S.M., P80) and associated local planning tools including:
  - Planning District Development Plan.
  - Rural Municipality Development Plan.
  - Rural Municipality Zoning Bylaw.
  - Provincial Land Use Policies Regulation (M.R. 184/94).

- The *Highways and Transportation Act* (C.C.S.M., H40) and associated regulations including:
    - Construction and Surface Maintenance of Access Crossings to Departmental Road Regulation (M.R. 412/188R).
    - Highways and Transportation Department Permit Application (M.R. 477/88).

- The *Highways Protection Act* (C.C.S.M., H50) and associated regulations.

Provincial "Sustainability Indicators" should also be considered (Manitoba round Table, undated).

6.2.2 Saskatchewan Provincial Acts

The most relevant statutes are:

- The *Environmental Assessment Act* (S.o.S., E-10.1), especially Clauses 3 and 9.

- The *Environmental Management and Protection Act* (S.o.S., E-10.21), especially Part IV, Division 3 (Permits respecting Discharges into Water and Alterations to Water Bodies).

6.2.3 Federal Acts and Regulations

The relevant statutes and regulations are:

- *Canadian Environmental Assessment Act* (SOR/92 – C.37)
    - The use of federal funds requires that the Project undergo a federal environmental assessment.

- *Canadian Environmental Protection Act* (SOR/99 – c.33).

- *Constitution Act* (1982, section 35 (3))
    - First Nations and Métis Rights are acknowledged and affirmed

  - Legally–prescribed bilateral consultation is required if proposed or existing developments have a direct or indirect effect on First Nations.

- *Navigable Waters Protection Act* (R.S. 1985, c.N-22)
  - Navigable Waters Bridges Regulations (C.R.C., c.1231);
  - Navigable Waters Works Regulations (C.R.C., c.1232).

- *Fisheries Act* (R.S. 1985, c.F-14)
  - Fish Habitat Protection and Pollution Prevention (Sections 34-43).

6.2.4 Relevant Regulatory Considerations

The legal and administrative complexity of the environmental assessment, regulatory review and licencing/permitting process for a project spanning 2 provinces and involving federal agencies is substantial. Many stakeholders are aware of this, and point out, with some frustration, the legal quandaries surrounding an interprovincial resource managed by only 1 of the 2 provinces (cf. Appendix I, p.2). If that were not enough, additional complexity will be present because of the prescriptions surrounding the Supreme Court of Canada case law on s.35 duties for Crowns to consult with Aboriginal peoples, especially given that some First Nations reportedly now believe their rights will likely be infringed by the Upgrade (Appendix E, pp.5-6). A considered enunciation of all possible regulatory-process considerations and other aspects of defining the scope of the subsequent EIA is beyond the scope of this study. Nonetheless, a number of uncertainties having potential to significantly affect the subsequent assessment/review processes is evident, including the following.

6.2.4.1 Broad Strategic 'Landscape'

Among others, the following key uncertainties require resolution in designing an EIA process capable of meeting the applicable statutory and policy requirements for the governments, stakeholders and Aboriginal communities at interest:

- whether independent parallel (or sequential) impact assessment and regulatory review processes will be required for the Upgrade in both Manitoba and Saskatchewan, and/or whether an integrated cooperative and non-duplicative single process (e.g., the process being followed for the Wuskwatim Generating Station and for the Floodway Expansion Projects) can satisfy the statutory requirements in both provinces;
- whether Canada has an obligation for assessment and approvals pursuant to the *Canadian Environmental Assessment Act*, the *Canadian Environmental Protection Act*, or both;
- the definition, for licencing purposes, of the "proponent" for this project;
- whether the proponent should submit an *Environment Act* Proposal Form ("EAPF") to formally trigger the Manitoba licensing process well before an EIA is complete or, conversely, whether both documents will be submitted simultaneously;
- how best to address the likely expression of concern from DFO where there is a potential for fish habitat to be implicated by the project, especially if Saskatchewan and Manitoba could have divergent views on the potential for habitat and/or population impacts;
- whether, or how, to address the Provincial Sustainability Indicators and related guidance on how to assess project "sustainability" (IISD 1996, James 1994, Gravelines and Schellenberg 1985);
- how best to consult with local populations, given that their interests may vary greatly, including the support for, and opposition to, the Upgrade;
- how the federal and provincial Crowns should best deal with any Aboriginal Peoples who may have traditional uses in or near the site and who may believe that their Rights could be infringed by the project (cf. Appendix E p.5), especially if consensus does not exist between Manitoba and Saskatchewan on the extent of a consultation duty consistent with s.35 of *The Constitution Act*, and how the Crowns approach(s) may impinge upon the scope, schedule and cost of the EIA process;
- how best to design, fund and schedule the EIA process if the information gaps or uncertainties discussed in Section 5 are not substantially remedied before the EIA is initiated; and
- how best to respond to queries regarding downstream studies and the extent of compensation that was offered to Kamsack-area farmers.

From the foregoing, it should be evident that the design and execution of the EIA process to discern, segregate and satisfy regulatory requirements is as much a legal and administrative exercise as it is technical.

6.2.4.2 Specific Issues

Effects of the project on the licenced rights of river-water users (Asessippi Ski Hill under the *Water Rights Act*) will likely require specific attention within the scope of the EIA. Legal or administrative implications of the proposed Upgrade on existing non-Aboriginal water-rights holders are not defined, and should be before the EIA is initiated.

It will prove important for protecting the simplicity of the EIA Project Description, and the schedule for the assessment process, that a clean and persuasive explanation is in place before the EIA begins that explains the relationship (or lack thereof) between the Shellmouth Upgrade, the Portage Diversion and the Winnipeg Floodway. (To some extent, this uncertainty could be clarified by the release of the EIA for the Floodway Expansion Project in mid-summer, 2004). The explanation should also explicitly identify the circumstances, and their likelihood, whereby any American water-management project discharging to the Assiniboine River Watershed could have a direct or indirect effect on the operating regime of the Upgraded Dam.

One potential EIA outcome worthy of careful early thought is the potential for a finding of negative project implications on Aboriginal rights and Entitlements. Any finding to this effect in the EIA would create duties for the provincial and federal crowns to consult with the potentially affected First Nation(s); (Sharvit, Robinson & Ross 1999), and the potentially impacted Métis peoples, pursuant to the case law under s.35 of the federal *Constitution Act* (including the recent Supreme Court Powley case [R.V. Powley 2003]). Because there is little or no provincial precedent for the "government-to-government" consultations with Aboriginals contemplated by this case law, there can be substantial uncertainty about how the federal and provincial Crowns should best proceed, especially if both Manitoba and Saskatchewan provincial duties to consult appear evident, and if the two provinces adopt different approaches. In addition, the entire question of Aboriginal water rights, a subject not yet adjudicated in Canada but the subject of several potentially relevant settlements involving Aboriginal communities and the Crown (Phare 2004; Rush 2004), can impinge upon the EIA (cf. Haida Nation v. B.C. (Min. of Forests) 1 2002;

Taku River Tlingit First Nation v. Riegstad *et al.* 2002) and any parallel or subsequent Aboriginal liaison process. Timely dialogue with respective legal counsel may be prudent, to ensure that Aboriginal Treaty Rights are addressed with due respect, water rights in particular.

Of important consideration prior to the initiation of the EIA is the completion of a thorough review, and exposition to the public, of the case for this project by contrast with the other technical alternatives. While this point has been made previously in this Scoping document, in terms of public desires for such information, the question of "need and justification" is also of particular regulatory significance, given that the project will require federal approvals. Under provisions of the *Canadian Environmental Assessment Act*, the question of "need" and "alternative means" must be thoroughly examined to satisfy the federal statutory requirements. Recent regulatory experience in Manitoba (e.g., Wuskwatim Generating Station), and other projects subjected to joint federal-provincial review in the past, have emphasized the need for a thorough and credible public review of "alternatives" prior to or as part of an EIA process. Failure to have such a thorough and credible review by the time the EIA is completed, typically means that any subsequent public regulatory-review process can be constrained, and its schedule can be substantially lengthened, to ensure that the federal statutory requirements are met, and (perhaps most importantly) ***seen*** to be met.

To ensure that this does not happen during the regulatory-review process for the planned Upgrade, the public consultations recommended in Section 5.1 should have particular and explicit attention to the concept of "alternatives".

6.2.5 Regulatory Liaison

The Steering Committee should maintain a cooperative and positive relationship with all regulators, at all levels. The EIA consultant can typically assist in the regulatory liaison process.

6.3 PUBLIC COMMUNICATIONS

The Steering Committee has made a good first impression with the invited public groups who participated in the Environmental Scoping Study meetings. To be successful, the EIA process should continue with a strong public consultation program that includes these participants and the broader public. A variety of public involvement methods are recommended including additional stakeholder meetings, Aboriginal community meetings, newsletters, public Open Houses, and a website. The existing stakeholder database that was created during the Scoping Study (cf. Appendices B and D) will be very useful in contacting and involving stakeholders during the EIA process. Newsletters and websites provide additional communication tools.

A series of Public Open Houses along the Assiniboine River is recommended (Kamsack, Roblin, Russell, Virden, Brandon, Portage, Winnipeg). The public involvement process should take place when the Project Description is relatively firm and preliminary judgements regarding the significance of effects have been made. Given that the Scoping Study meetings were not intended to provide a Project Description nor to answer stakeholders' questions related to potential impacts of the project, it is particularly important that the EIA public involvement should include the results on the preliminary engineering studies. The need to address alternatives was evident in the Scoping Study meetings and this should be addressed in the Open House information.

While the government Steering Committee presented the majority of the information to the public during the scoping study meetings, the EIA consultant should present the EIA public involvement information, for many reasons (e.g., to reduce the potential for charges of conflict of interest against the government). The discussion at this time should include details on the project itself and also preliminary judgements as to the environmental, economic, and socio-cultural effects of the project. The Steering Committee should present information on and ask questions related to the Project. As the judgements of significance must be done via a third-party assessment of a project, it is essential that the independent consultant present this type of information. Storyboards, for example, could be used to present the information to small groups of people as they tour the boards with the different presenters involved at different points. A survey tool that addresses the usefulness of the information, opinions of the project and the relayed judgements regarding effects, and additional concerns and comments should be used to collect information at these events. Other information-gathering tools, and information-request tools may also be desired.

Meaningful public consultation may be achieved through early notification of the public Open House in each community (e.g., advertisements placed in local newspapers 2 weeks prior to the meetings), appropriate scheduling of public meetings (e.g., at a time when farming communities can attend, with parking, during non-working hours, child-friendly facilities, etc.). The contact list created through this scoping process could also be used to send personal invitations indicating whether or not meetings would be identical in nature to the Open Houses. A list of all of the public Open Houses, including date, location, and time should be included in the advertisement, space permitting, as many landowners and users of the Assiniboine River and Lake of the Prairies likely live between Open House locations.

A successful public consultation will include:

- jargon-free presentation of information;
- language appropriate advertisements (e.g., English, French, Cree, etc.)
- storyboards, fact sheets, videos, and questionnaires;
- language-appropriate question and answer opportunities; and,
- one-on-one discussions at the Open House.

Table 6-1 displays the minimum and optional activities that should be considered to ensure a successful and meaningful public consultation program.

It would be advisable to conclude the downstream and EIA studies contemplated in the Consolidation Agreement with a final public outreach process (e.g., Open Houses) even if the Upgrade does not proceed, to bring an appropriate closure to the public-consultation process.

6.4 ABORIGINAL COMMUNICATIONS

The Centre for Indigenous Environmental Resources facilitated the Aboriginal meetings for the Scoping Study. On the basis of this process, the Steering Committee has initiated communication and trust building with the communities. Four First Nations have indicated their interest in hosting future meetings (including inviting neighbouring communities) during the EIA process. CIER considers this to be a very positive step in developing and maintaining working relationships between the First Nations and the Steering Committee (cf. Appendix E).

TABLE 6-1
ELEMENTS IN PUBLIC-CONSULTATION STRATEGY AVAILABLE TO SHELLMOUTH DAM STEERING COMMITTEE FOR THE PROPOSED SHELLMOUTH DAM UPGRADE

STEERING COMMITTEE SHOULD/MUST DO	WOULD BE GOOD TO DO (Desirable, useful, effective, practical)	DESIRABLE, USEFUL BUT MORE COSTLY	DESIRABLE BUT OF SOMEWHAT UNCERTAIN BENEFIT	STEERING COMMITTEE SHOULD NOT DO
Commit to public involvement process; advise Manitoba Conservation	Share results of any prior public liaison with target audiences	"Kitchen-table" neighbour/ group meetings in selected homes	Advertisement in Winnipeg Free Press and local newspaper (using format analogous to Manitoba Conservation ads), soliciting public feedback	Plan and host "Town Hall" meeting
Define target audience(s)	Create "flyer" with clip-out, mail-back coupon	"Key-Person" interviews	Create information "public registry" in a local public library; stock all consultant and PFRA/Water Stewardship reports, relevant government correspondence; support local public registry manager	
Create basic information package	Flyer mail-out to local "neighbourhood"	Plan and host public "Open House"		
Local newspaper advertisement (possibly with clip-out, mail-back coupon)	Create Project website; include EIA Scoping Report	Stakeholder meetings; follow-up from Scoping Study		
Infopak mail-out to selected target audience(s)	Regular briefing "advertisements" in regular newspaper, soliciting reactions	Aboriginal community meetings; follow-up from Scoping Study		
Maintain database of respondents, contacts, issues, concerns, etc.	Project EIA newsletter			
Organize/host Shellmouth Dam tour for interested respondents and provide information requested by respondents				
Report results of public liaison in EIA				

━━━━━━━━ Minimum recommended public consultation activities for EIA

- - - - - - - - Optional useful public consultation activities

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The Steering Committee has made a positive first impression with the First Nation communities and Métis peoples by acknowledging their unique role regarding participation and consultation. This should be carried forward throughout the EIA process. A minimum of four First Nation meetings and four Métis meetings should be held during the EIA process, using culturally appropriate consultation techniques (such as those employed by CIER), such that Aboriginal perspectives and issues can be communicated to the EIA team on a timely basis.

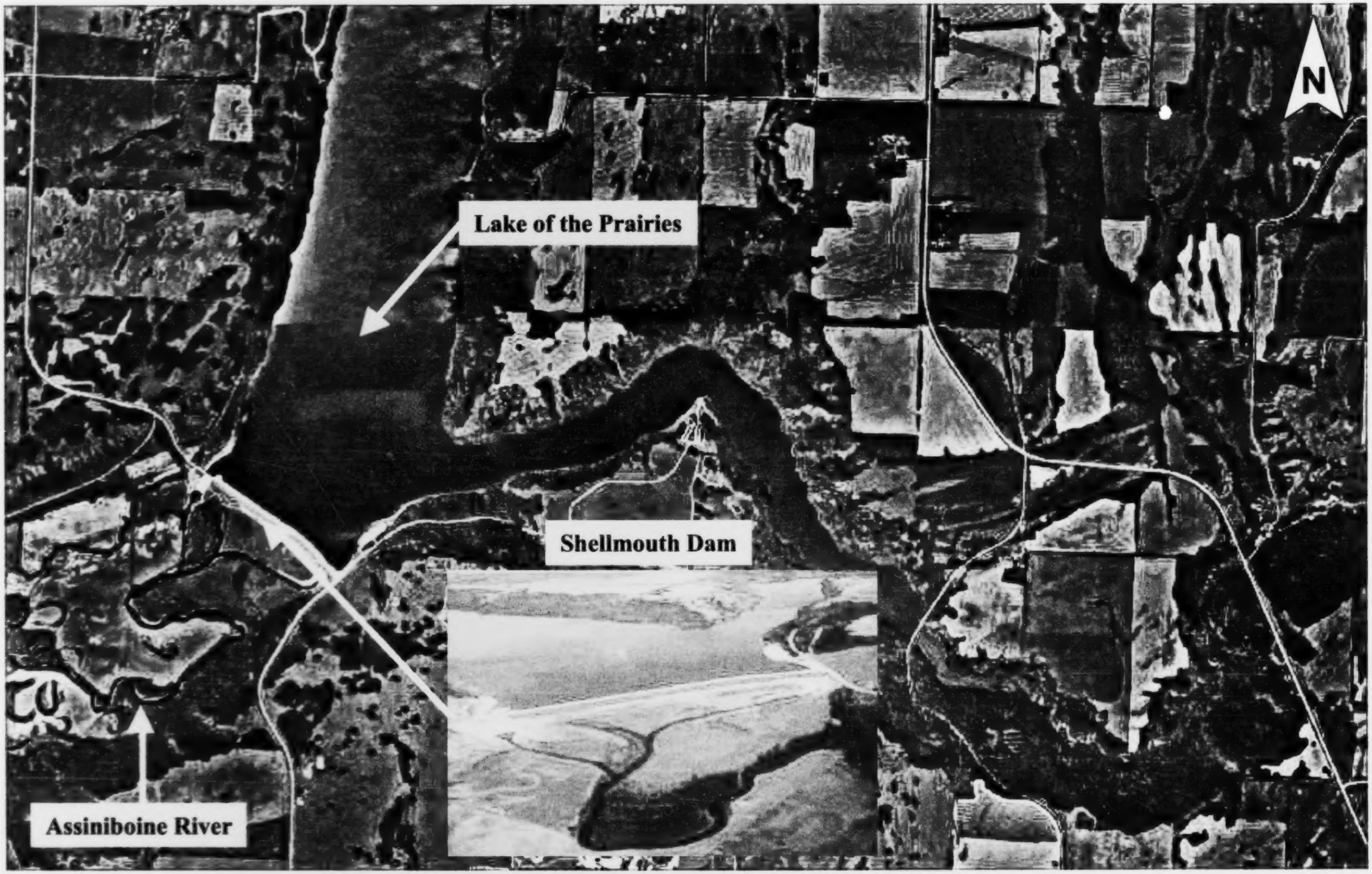
Because the documentation of discussions with the Métis peoples was completed after this report, it will be important that the EIA consultant and the Steering Committee ensure that the Métis issues and perspectives are accorded the equivalent attention as those of the First Nations.

As well, it may be prudent for PFRA/Manitoba Water Stewardship to evaluate the current capacities of Aboriginal communities and peoples to fully engage with the EIA process, and with any subsequent approved/licenced project, and to consider whether, and how, to build these capacities.

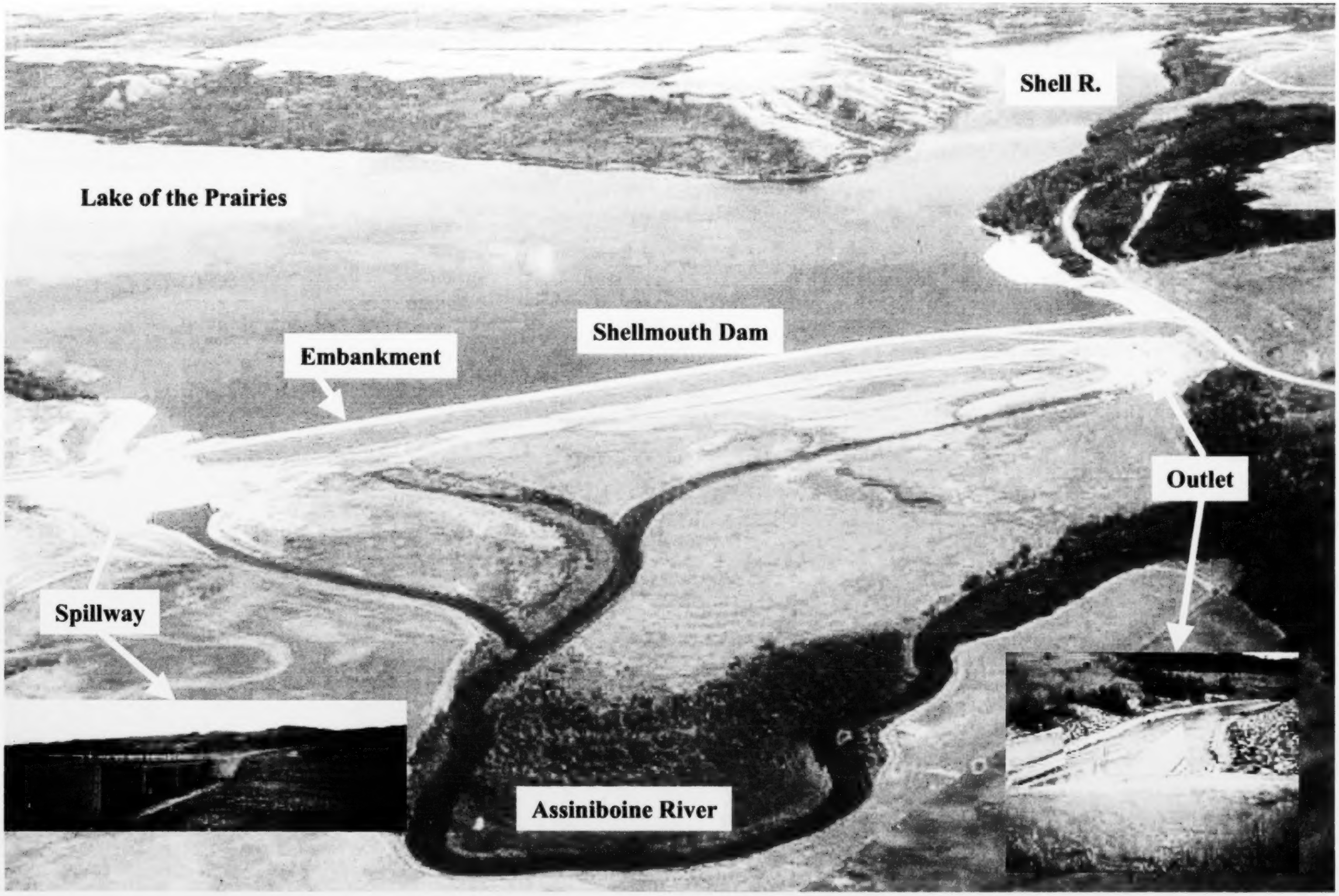
6.5 ENVIRONMENTAL SETTING

This Environmental Setting summarizes the general characteristics of the Shellmouth Dam and Lake of the Prairies areas (Figures 6-2 and 6-3) referenced by the stakeholder, elected official, government and Aboriginal participants in the discussions documented in Appendices E through O, inclusive. Supporting background information is provided in Appendix P. (Much of this information may be useful in the subsequent EIA).

The following description of the biophysical and socio-economic features of the area therefore reflects the geographical context for the range of concerns discussed by the areas' public and First Nations peoples. In general, greater detail is provided on what might be referred to as the "Upper Assiniboine River" area. Generalized information is also provided for the more downstream reaches of the Assiniboine River as it relates to the more focussed concerns expressed by residents in this region. Concerns with downstream reaches were generally related to water quality, drought, water availability and flood management.


N
Lake of the Prairies
Shellmouth Dam
Assiniboine River

Shellmouth Dam and
Lake of the Prairies
Figure 6-2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Outlet
Spillway
Assiniboine River

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Shellmouth Dam
Outlet and Spillway
Figure 6-3

6.5.1 Lands

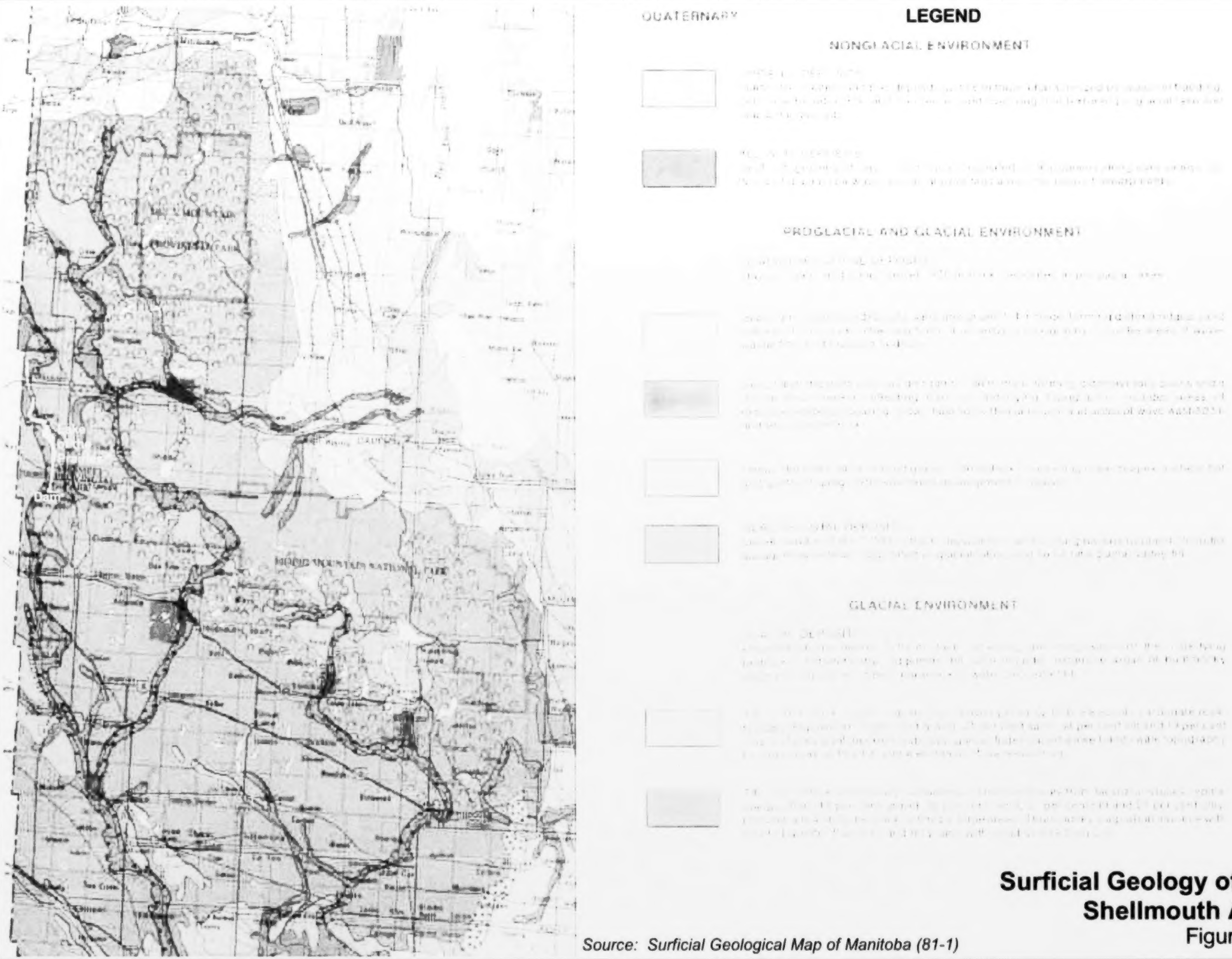
6.5.1.1 Geology, Geography and Soils

Most of the area is underlain by Cretaceous shale and sandstone of the Riding Mountain Formation; a marine sedimentary layer approximately 300 ft thick, composed of noncalcareous silty clay (Smith *et al.* 1998; Betcher, Grove & Pupp 1995; Martz *et al.* 2002; see also http://www.stpeters.sk.ca/crse/_pdfs/crescent_creek/crescent_creek_chapter3.pdf). This layer was established during the Upper Cretaceous period some 65 to 99 million years ago. As shown in Figure 6-4, the shale and sandstone is overlain by glaciofluvial deposits (i.e., till) and more recent alluvial deposits.

The soils in the study area of the Lake of the Prairies and the Assiniboine River are a product of the most recent glacial period. The rich lacustrine soils were created from deposited sediments of a glacial lake, Lake Agassiz. Chermozemic and luvisolic soils are present in the study area; these soils have a large organic matter content and reside in the upland encompassing the Assiniboine River. Regosolic soils are highly fertile due to alluvial deposits that occur during floods. Furthermore, the soils in the study area are eroded easily; with the interaction of a gently sloped topography, the waterways have large sediment loads and meandering channels (Shewchuk 1999, Sadar and Dirschl 1996).

6.5.1.2 Ecozones, Ecodistricts and Ecoregions

The area of potential project effects includes the Shellmouth Dam and environs and the areas downstream as far as Winnipeg (Figure 6-5). It encompasses two ecozones that contain four ecoregions (Table 6-2). There are a total of sixteen ecodistricts within the five ecoregions. Three of these ecoregions and nine of these eocdistricts are likely implicated by the project, (although the actual geographic "area of influence" cannot be defined with precision at this time) (Table 6-2). The climate, physiography, drainage, soils and vegetation conditions vary from area to area.


QUATERNARY
LEGEND
NONGLACIAL ENVIRONMENT
PROGLACIAL AND GLACIAL ENVIRONMENT
GLACIAL ENVIRONMENT
DUCK MOUNTAIN
PROVINCIAL PARK
DAUPHIN
RIDING MOUNTAIN NATIONAL PARK
Dam

Source: Surficial Geological Map of Manitoba (81-1)

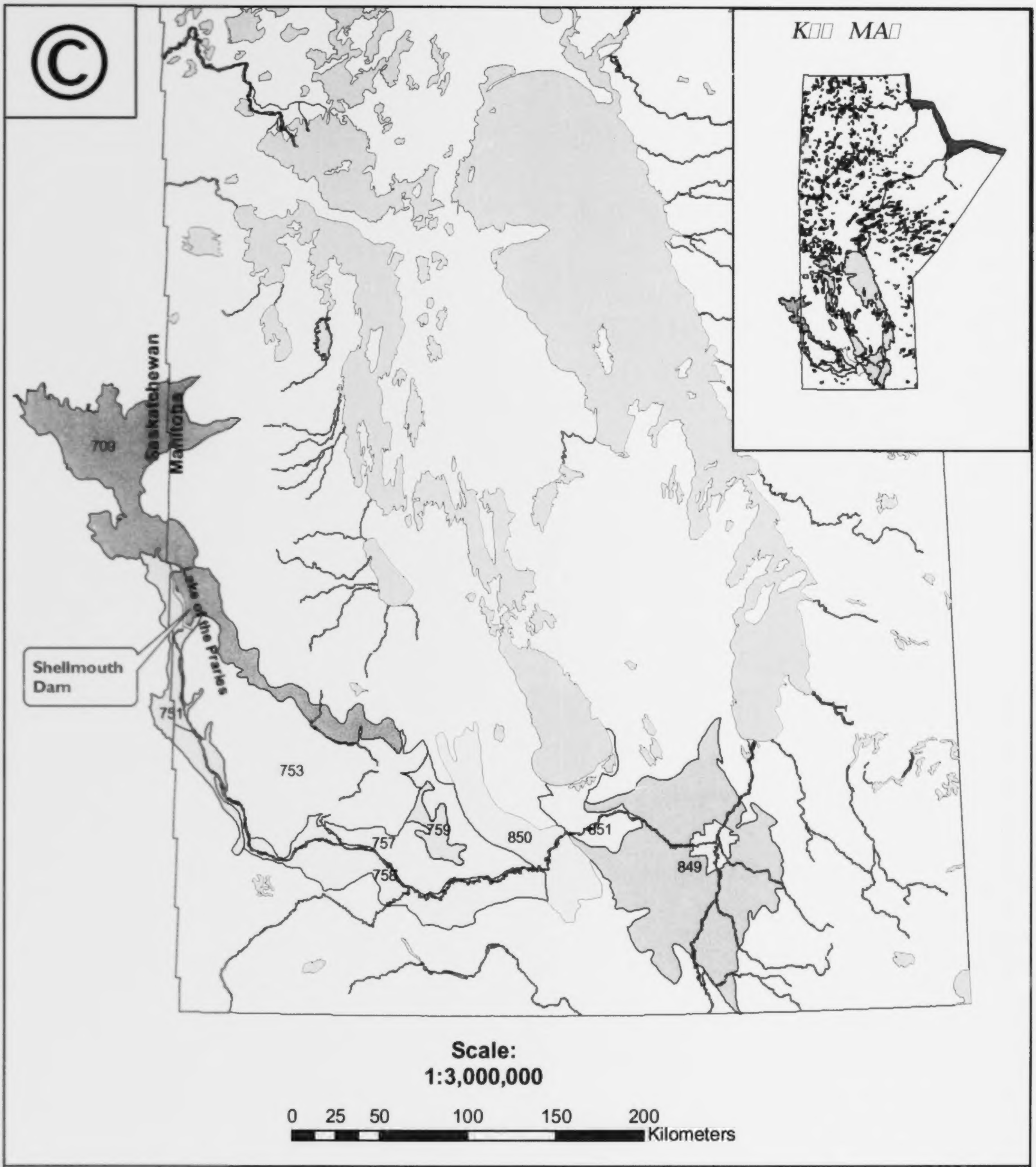
Surficial Geology of the Shellmouth Area
Figure 6-4

LEGEND

Surficial Geology of the Shellmouth Area

Figure 6-4

Source: Surficial Geological Map of Manitoba (81-1)

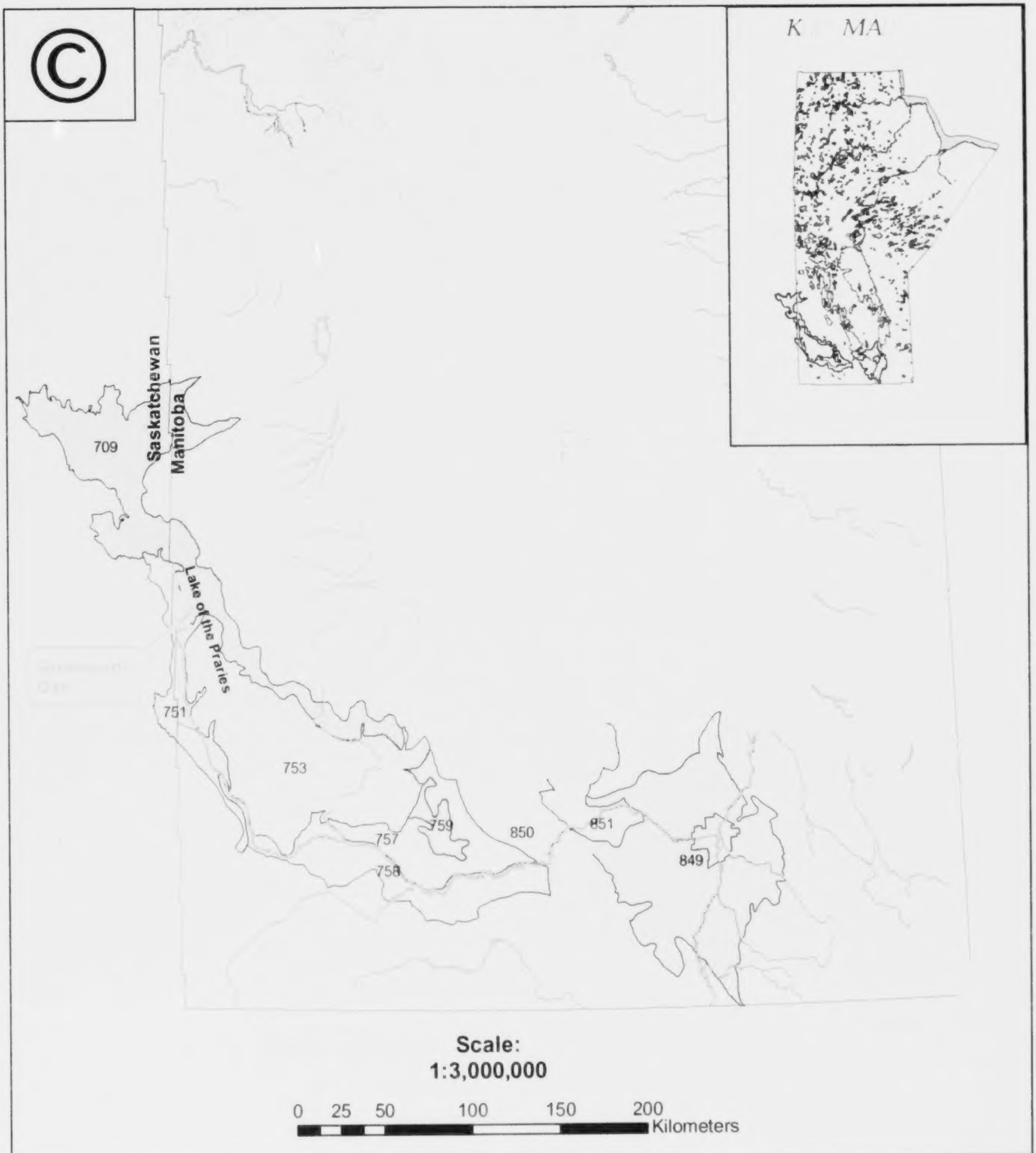

KEY MAP
Saskatchewan
Manitoba
709
Lake of the Praries
Shellmouth Dam
751
753
757
758
759
850
851
849
Scale:
1:3,000,000
0
25
50
100
150
200
Kilometers
Legend
Ecodistricts
709-Swan River
751-St. Lazare
753-Hamiota
757-Shilo
758-Stockton
759-Carberry
849-Winnipeg
850-MacGregor
851-Portage

Source:

Ecological Stratification Working Group. 1996. A National Ecological Framework for Canada. Agriculture and Agri-Food Canada, Research Branch, Centre for Land and Biological Resources Research and Environment Canada, State of Environment Directorate, Ottawa/Hull.

Ecodistricts Implicated by Proposed Upgrade

Figure 6-5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Lake of the Praries
751
753
759
757
758
850
851
849
Scale:
1:3,000,000
0
25
50
100
150
200
Kilometers

Legend

Ecodistricts

- ☐ 709 Swan River
- ☐ 751 St. Lazare
- ☐ 753 Hamiota
- ☐ 757 Shilo
- ☐ 758 Stockton
- ☐ 759 Carberry
- ☐ 849 Winnipeg
- 850 MacGregor
- ☐ 851 Portage

Source:

Ecological Stratification Working Group. 1996. A National Ecological Framework for Canada. Agriculture and Agri-Food Canada, Research Branch, Centre for Land and Biological Resources Research and Environment Canada, State of Environment Directorate, Ottawa/Hull.

Ecodistricts Implicated by Proposed Upgrade

Figure 6-5

TABLE 6-2

ECODISTRICTS APPARENTLY IMPLICATED BY THE SHELLMOUTH PROJECT

Ecozone	Ecoregion	Ecodistrict
Prairies	Aspen Parkland (156)	751 - St. Lazare 753 – Hamiota 757 - Shilo 758 – Stockton 759 - Carberry
	Lake Manitoba Plain (162)	849 - Winnipeg 850 - MacGregor 851 – Portage
Boreal Plains	Boreal Transition (149)	709 - Swan River

Source: Smith *et al.* 1998

6.5.1.2.1 Aspen Parkland Ecoregion

This region is underlain by Cretaceous shale bedrock that is almost entirely covered by undulating calcareous, loamy glacial till or glaciolacustrine sediments. Significant areas of level to gently underlying glaciolacustrine sands occur in the eastern (Assiniboine Delta) portion of the ecoregion. Numerous ponds and sloughs are also associated with morainal (glacial till) deposits. Drainage is generally eastward. Native vegetation is mixed wheat grass and fescue prairie associated with aspen and bur oak groves. Deciduous shrubs are an important component of most communities. Slough grass, sedges, cattails and willows are found in depressions and surrounding lake margins. Most of the "better drained" lands have been converted to farmland. Soils are predominantly Black Chernozems on glacial till and sandy lacustrine deposits, with Humic Gleysols in poorly drained depressions and Regosols on eolian sand deposits (Smith *et al.* 1998).

6.5.1.2.2 Boreal Transition Ecoregion

The Boreal Transition Ecoregion, which the Lake of the Prairies is part of, is located within the Boreal Plains Ecozone. This region makes up approximately 20% of the study area. The region is underlain by Cretaceous shale bedrock, which is almost entirely covered by thick, kettled to hummocky, calcareous, loamy till and glaciolacustrine deposits. Vegetation consists of closed stands of trembling aspen, balsam poplar and shrubs mixed with minor occurrences of white spruce and balsam fir. Sedges and willows, with some black spruce and tamarack occupy depressional areas. Soils are predominantly Dark Gray Chernozems, with local areas of Black Chernozems, Gray Luvisols, Peaty Gleysols and Organic Mesisols (Smith *et al.* 1999).

6.5.1.2.3 Lake Manitoba Plain Ecoregion

The ecoregion is underlain by low-relief, flat lying Paleozoic limestone bedrock and is covered by glacial till and by silts and clays deposited by glacial Lake Agassiz. Black chermozemic soils have developed on loam and clay loam till materials of the region while Gleysolic soils have developed on the clay glaciolaustrine sediments. Some of the most productive agricultural soils in Manitoba are found in this ecoregion (Smith *et al.* 1999).

In Manitoba, trembling aspen and shrubs occur on moist sites, while bur oak and grassland communities occupy increasingly drier sites. The poorly drained sites of the region, support slough grasses, cat-tails, sedges and an assortment of willow shrubs.

6.5.1.3 Vegetation

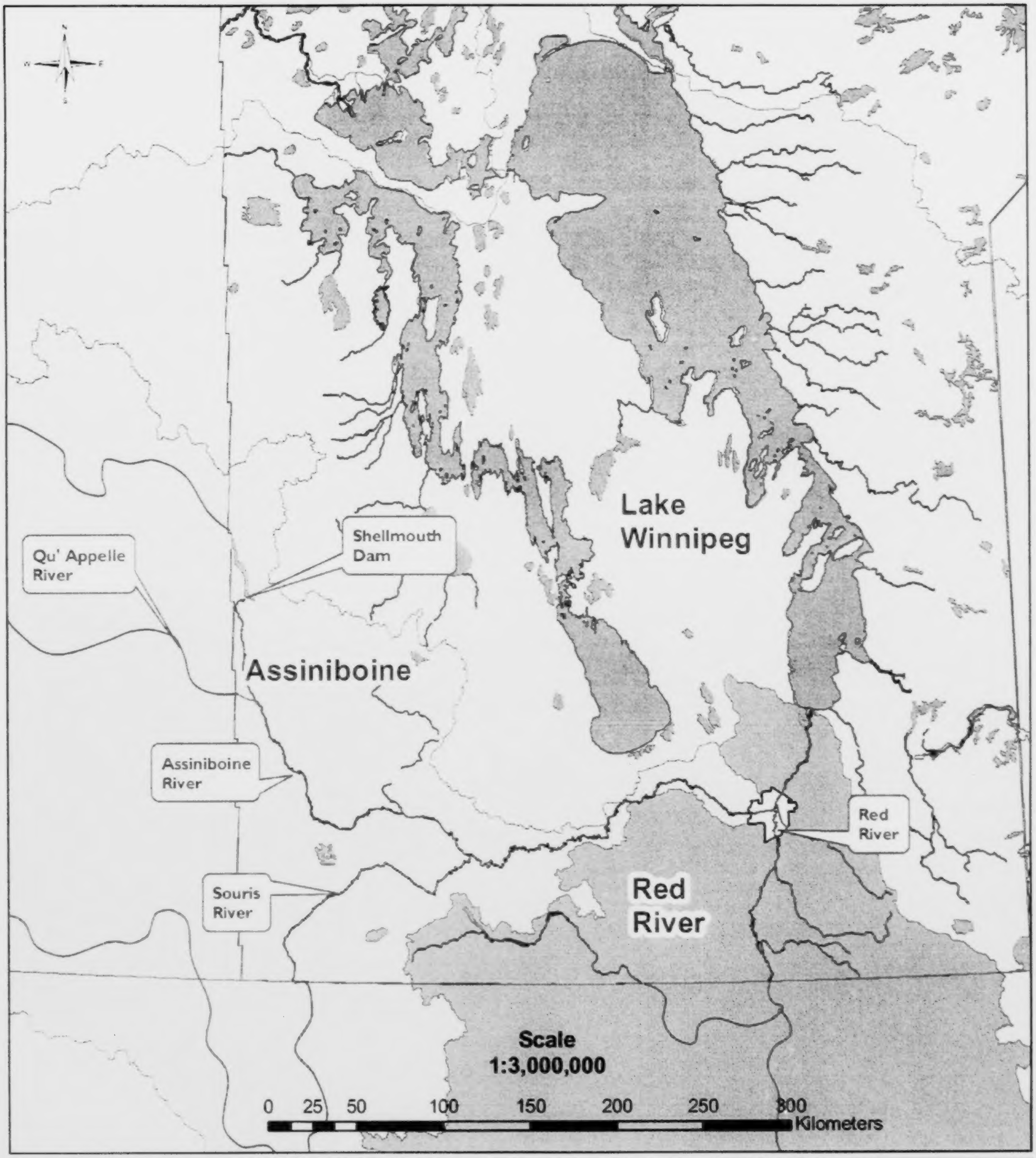
In the Upper Assiniboine River, the vegetation is grassland in the valley bottom and the uplands with interwoven aspen and groves. White birch, balsam poplar, bur oak, Manitoba maple, green ash, American elm, and cottonwoods are historically supported tree species in the valley slopes. Some examples of understory shrubs are saskatoon, snowberry, highbush cranberry, pin cherry, willow varieties, and red osier dogwood; this vegetation provides a food source and shelter for mammals such as white-tailed deer and moose (Shewchuk 1999).

6.5.2 Aquatic Resource

The Assiniboine River headwaters are located approximately 50 km northwest of Preeceville, Saskatchewan and its major tributaries include: the Qu'Appelle River (which joins the Assiniboine at St. Lazarre, Manitoba) and the Souris River (which joins the Assiniboine east of Brandon; Figure 6-6). Other major tributaries supplying the Assiniboine include Shell River (Environment Canada *et al.* 2000).

The northern headwaters, located within the Boreal Plains Ecozone, are characterized by groves of brush, wooded bluffs, steeper flow gradients, and reasonably well-defined drainage patterns. The southern portion, located within the Prairie Ecozone, is characterized by a hummocky landscape of dimpled depressions, sloughs and potholes. Convection activity in air masses originating near the Gulf of Mexico are experienced regularly in the area and supply most of the annual moisture in significant summer rainfall events (Environment Canada *et al.* 2000).

Lake of the Prairies is an artificial impoundment and is the largest lake in the region.


N
W
E
S
Lake Winnipeg
Shellmouth Dam
Qu' Appelle River
Assiniboine
Assiniboine River
Souris River
Red River
Red River
Scale
1:3,000,000
0
25
50
100
150
200
250
300
Kilometers

Legend

Major Basins

- ▭ Assiniboine River
- ▭ Lake Winnipeg
- ▨ Red River

Source:
Ecological Stratification Working Group. 1996. A National Ecological Framework for Canada. Agriculture and Agri-Food Canada, Research Branch, Centre for Land and Biological Resources Research and Environment Canada, State of Environment Directorate, Ottawa/Hull.

Geodetic Model ,Horizontal Datum North American Datum of 1983 Zone 14 Ellipsoid Name Geodetic Reference System 80

Major Watershed Basins

Figure 6-6

At its confluence with the Red River in Winnipeg, Manitoba, the Assiniboine River encompasses a drainage area of approximately 160,000 km^2. At this point, the Assiniboine River includes drainage from a number of tributaries, including semi-regulated flows from the Qu'Appelle River and the regulated flow from the Souris River basin, in addition to numerous small drainage basins (Figure 6-6).

6.5.2.1 Water Resources

The Assiniboine River Basin supports the domestic, industrial, recreational, effluent-assimilation and agricultural water needs (Environment Canada *et al.* 2000) of:

- the people living in the larger communities of Yorkton, Melville, Kamsack, Canora, Preeceville, Roblin, Russell, Brandon, Portage la Prairie and Winnipeg;
- Aboriginal and other smaller communities and individual farms located throughout the area around the reservoir and in downstream areas;
- more than 100 small-scale irrigation projects and almost 200,000 head of livestock; and
- fish, wildlife, and waterfowl habitat.

6.5.2.2 Surface Water Resources

Surface water supply is highly variable. Annual precipitation is the principal source of water in the southern portion of the study area in Manitoba (Smith *et al.* 1998). In the northern part of the area, the Duck Mountains in Manitoba and Saskatchewan, and numerous lakes and ponds help to moderate the supply of surface water. Flow peaks on the Assiniboine River typically occur during spring runoff and rapidly decline to base levels as the summer continues. April and May account for 63% of annual flow of water into the study area while December to March account for three percent. The mean annual volume of the study area is 467,000 dam^3 with an historical high of 1,820,000 dam^3 in 1922 and an historical low of 60,000 dam^3 in 1961 (Environment Canada *et al.* 2000; Smith *et al.* 1998).

The highly variable water supply experienced in the area has lead to an emphasis on water storage. Minor dams and reservoirs located in the area include: Canora Weir and Theodore

Reservoir on Whitesand Creek, Melville Dam on Crescent Creek, Kamsack Weir on the Assiniboine River, the Yorkton South Project on Yorkton Creek and the larger impoundment at Shellmouth Dam and the Lake of the Prairies (Environment Canada *et al.* 2000). The Portage Diversion at Portage la Prairie is a key component (along with the Shellmouth Dam) of the flood-control infrastructure on the Lower Assiniboine River.

Other smaller dams and control structures are located throughout the study area to aid in water storage for various local uses (i.e., municipal and agricultural water supplies) and maintaining water levels for recreational and wetland habitat uses.

6.5.2.3 Surface Water Quality

Water quality of most surface waters within the study area is generally acceptable for most uses (i.e., municipal, agricultural, industrial, etc.). Table 6-3 outlines some of the key surface waterbodies located in the region and the relationship between raw water quality and its suitability for water uses (i.e., without treatment). Impoundment-water quality (e.g., Lake of The Prairies) is considered to be compromised (e.g., Gurney and Fortin 1992, Fortin and Gurney 1997). Identified water-quality issues are related to odour and taste of water supplied by reservoirs and are usually linked with algae growth (cf. Gurney and Jones 1997) potentially caused primarily by nutrient inflows from municipal lagoons, livestock operations, and agricultural runoff. The smaller natural waterbodies within the study area also tend to experience marginal water quality, which is typical for waterbodies of this type in the prairie region. Poor water quality is attributed to human activity and soil characteristics (Environment Canada *et al.* 2000).

6.5.2.4 Groundwater Resources

Within the study area, groundwater supply is more stable from year to year than is surface water, although groundwater sources are unable to supply large quantities to one area. There are two types of aquifers found within the Study area:

TABLE 6-3

SUITABILITY OF WATER QUALITY IN LOCAL SURFACE WATERBODIES FOR ACTIVITIES IN THE STUDY AREA

WATERBODY	RECREATION	IRRIGATION	AQUATIC LIFE	LIVESTOCK WATERING
Assiniboine River*	√	(√)	√	√
Shell River*	√	√	√	√
Lake of the Prairies	√	√	√	√

*	Using data from water quality monitoring stations upstream of known waste water discharges to represent ambient conditions
√	Suitable
(√)	Suitable with some limitations based on soil irrigated and crop grown
X	Not Suitable

Source: Environment Canada *et al.* 2000

- bedrock aquifers (typically of reasonably high yield and insulated from surface drought conditions); and
- intertill aquifers (typically of superior quality and susceptible to contamination and drought conditions.

A localized intertill aquifer called the "Virden Fill" has also been identified extending near Kamsack, Saskatchewan to the headwaters of Lake of the Prairies (Woodvine *pers. comm.* 2003).

The Assiniboine Delta Aquifer (ADA; or "Carberry Aquifer") is a large unconfined (i.e., open to the ground surface – not trapped between layers of impervious strata) surface aquifer vulnerable to development impacts (Frost and Render 2002) encompassing an area of 3,885 km^2 (Kulshreshtha 1994). It serves as a potable water supply for domestic, municipal, agricultural, industrial and irrigation purposes to approximately 12 downstream Rural Municipalities with an estimated combined population of approximately 10,000 (Carberry/RM of Cypress 2003). Presently, agricultural producers are the largest single water user in the region (Kulshreshtha 1994), reflecting the fertility of soils in the region (Burton and Ryan 2000).

While Burton (2000) indicates major land use allocation associated with the ADA as cropland and forage (46%), grassland (27%), forest (21%) with other land uses accounting for the remaining 10%, while the Summary of Background/Technical Reports (made available by the Town of Carberry and RM of Cypress [2003]) indicate land-use allocation as 47% annual cropping, 4% forage, 16% grassland, 16% treed, and 9% other uses (such as wetland, open water and developed areas). In either case, agricultural cropland accounts for approximately 50% of total land area in the region. Approximately 39% of the total land area overlying the aquifer is rated either "excellent" or "good" for irrigation; however, this same land is considered "environmentally sensitive", due to the predominance of well-drained coarse-textured surface deposits that lie above the aquifer (Frost 2000). The nature of this type of geology and exposure of the aquifer to land surface, make it highly vulnerable to groundwater contamination from sources such as (but not limited to) effluent and agricultural fertilizers (Frost 2002 and Burton 2000).

Recharged by natural precipitation (snowmelt and surface runoff), the groundwater flow of the ADA generally follows the expected pattern of downward movement (in the upland areas influenced by gravity), lateral movement, and upward movement (beneath the lowlands). The Assiniboine and Whitemud rivers along with Pine and Squirrel creeks receive discharge waters from the ADA (Kulshreshtha 1994). Other important waterways draining the ADA include the Cypress, Souris and Little Souris rivers and Epinette Creek (Burton 2000).

In 1994, Kulshreshtha reported that the ADA, with an average thickness of 18.29 m, has an annual recharge capacity of 60,378 dam^3 of water. Located in a predominantly agricultural region, Kulshreshtha (1994) noted that only 16.7% of the annual recharge capacity of the aquifer was being utilized for direct withdrawal uses. In 1990, it was estimated that 10,064 dam^3 of water was utilized from the aquifer for agricultural uses (69%), domestic uses (20%) and industrial uses (11%). In addition to direct withdrawal, Kulshreshtha (1994) reports that the ADA discharges 41,185 dam^3 to the Assiniboine River annually, increasing the total groundwater withdrawal from the ADA to approximately 51,249 dam^3 (or 85% of the annual recharge capacity).

The economic value of the water contained within the ADA (calculated based on assumptions outlined in Kulshreshtha [1994]) indicated that changes in the quality, quantity and availability of groundwater in the ADA could have serious repercussions to the regional economy. Thus any project-related effects on the ADA would likely be considered "significant". Potential threats to the ADA that must be considered in the development of an appropriate management plan for the aquifer include, overuse leading to the depletion of the natural resource and point and/or non-point pollution sources caused by activities such as agricultural practices, livestock activity, and uncontrolled disposal of sewage and other effluents within the region (Kulshreshtha 1994).

In 2002, Frost reported that an estimated 166,000 acre-feet (204,757 dam^3) of groundwater (as an annual, average outflow) flows through the aquifer and is available for stream-flow. Of this available amount, Frost (2002) indicates that approximately 6,000 acre-feet (7,400 dam^3) of water per year are withdrawn for domestic, industrial and agricultural uses and 23,000 acre-feet (28,370 dam^3) are withdrawn by irrigation systems. The remaining water serves as a base-flow within the aquifer system. Discharges of at least 100 cfs (0.00283 dam^3s^{-1}) are discharged into the Assiniboine River annually, representing a significant contribution to the total stream-flow of the Assiniboine (particularly during low flow periods; Frost 2002). Frost (2002) also indicates that management of the aquifer to date has provided sustainable development for domestic, municipal, agricultural, industrial and irrigation uses.

The Manitoba Crop Diversification Centre (MCDC) has noted that the combination of an unconfined aquifer (similar to that of the ADA) underlying coarse-textured material with agricultural land use can create the potential for aquifer contamination (Carberry/RM of Cypress 2003). Expansion of intensive crop production, irrigation and livestock production could further increase the risk of contamination due to the geological setting of the aquifer and the suitability of the land for agricultural development and use (Carberry/RM of Cypress 2003). The quality of water recharging the aquifer requires special attention to ensure the quality of the water in the aquifer is protected. Appropriate land use planning and management practices along with public education designed to improve awareness for the potential for contamination from point and non-point sources are paramount (Carberry/RM of Cypress 2003).

6.5.2.5 Groundwater Quality

Water quality of intertill and surficial aquifers is generally superior to that of bedrock or deeper aquifers. However, these groundwater sources cannot be relied upon as the comparatively rapid recharge rate commonly experienced by surficial aquifers makes them highly susceptible to contamination and drought (Environment Canada *et al.* 2000).

6.5.2.6 Fish

Except for Lake of The Prairies, few of the waterbodies found within the study area can adequately sustain fish populations. Local stocks of species including northern pike and yellow perch are supplemented through stocking programs. Other species found in waterbodies within the study area include: walleye, mooneye, common carp, white sucker, silver and northern redhorse, blacknose dace, brook stickleback, chestnut lamprey, emerald and spottail shiner, blackside and johnny darter (Environment Canada *et al.* 2000). Appendix P, Table P-2 summarizes species presence and/or absence within waterbodies found in the study area as indicated by Manitoba Conservation (2003a), Merkowsky (2003), Murphy (2003) and Stewart (2004). There is limited information available for some of the smaller waterbodies as little to no fisheries research has been conducted on these waterbodies.

The Assiniboine River, upstream of Lake of the Prairies, provides significant spawning habitat for walleye (Environment Canada *et al.* 2000). It has been suggested that Lake of the Prairies is considered one of the major sport fisheries in Manitoba (Fraser 2003). Appendix P (Table P-4) provides a complete species listing and habitat preference of species suspected or known to reside in the Assiniboine River.

The topography and tree cover along the Upper Assiniboine River Basin, lend itself for increased recreational use by the public, including activities such as canoeing and fishing. Many provincial and regional parks are located within the area, offering a number of all season aquatic recreational uses.

6.5.3 Terrestrial Wildlife

6.5.3.1 Mammals

It is suspected that over 50 species of mammals potentially reside within and/or utilize portions of the diversity of habitats offered within the study area (see Appendix P, Table P-5 for a list of mammal species potentially occurring in this area). General characterizations of habitats within the study area are as follows: cropland (69% of the basin area), woodland (13%), native grassland (8%), native grassland used for pasture (7%) and hay land (3%; Environment Canada *et al.* 2000).

Although the area is predominantly utilized for agricultural purposes, well-established shelterbelts, natural woodlands and native grasslands still remain. These habitats are fundamental in supporting various wildlife species such as white-tailed deer, an important game animal to Aboriginal and other hunters. The value of this species to hunters is apparent through harvest estimates gathered from Game Hunting Area (GHA) 22 (Table 6-4).

Other wildlife in the region include coyotes and beaver, two main furbearers trapped along an estimated 12-20 active traplines dispersed throughout the study area (Tirschmann *pers. comm.* 2003). Sightings of wolves, lynx, fisher and marten are occasional within the region. Black bear sightings/encounters are more common within the study area as a result of a well-established healthy resident population. Consequently, local black bear populations support an annual

TABLE 6-4

WHITE-TAILED DEER HARVEST STATISTICS FOR GAME HUNTING AREA (GHA) 22

YEAR	ARCHERY DEER (resident*)	GENERAL DEER (resident*)	MUZZLE LOADER DEER (resident*)	SECOND DEER LICENCE (resident*)	ARCHERY DEER (non-resident*)	GENERAL DEER (non-resident*)	BLACK BEAR (resident*)	BLACK BEAR (non-resident*)	TOTAL
1993	67	3842	364	-	-	-	10	-	4283
1994	81	4192	454	21	-	-	6	-	4754
1995	125	4092	539	988	-	-	5	-	5749
1996	119	3515	610	1794	-	-	9	-	6047
1997	60	2627	462	1237	5	-	10	-	4401
1998	92	3732	558	-	6	1	21	7	4417
1999	93	3844	444	1024	16	-	13	7	1597
2000	111	3798	582	19	-	-	14	15	4539
2001	86	2985	483	2	-	-	3	18	3577
2002	58	2304	487	3	-	-	3	-	2855
TOTAL	892	34931	4983	5088	27	1	94	47	42219

Source: Knudsen 2003

* of Canada

P:\docbank\0320A03\reports\table 6-4 white-tailed deer stats GHA22.xls

TABLE 6-4

WHITE-TAILED DEER HARVEST STATISTICS FOR GAME HUNTING AREA (GHA) 22

YEAR	ARCHERY DEER (resident*)	GENERAL DEER (resident*)	MUZZLE LOADER DEER (resident*)	SECOND DEER LICENCE (resident*)	ARCHERY DEER (non-resident*)	GENERAL DEER (non-resident*)	BLACK BEAR (resident*)	BLACK BEAR (non-resident*)	TOTAL
1993	67	3842	364	-	-	-	10	-	**4283**
1994	81	4192	454	21	-	-	6	-	**4754**
1995	125	4092	539	988	-	-	5	-	**5749**
1996	119	3515	610	1794	-	-	9	-	**6047**
1997	60	2627	462	1237	5	-	10	-	**4401**
1998	92	3732	558	-	6	1	21	7	**4417**
1999	93	3844	444	1024	16	-	13	7	**1597**
2000	111	3798	582	19	-	-	14	15	**4539**
2001	86	2985	483	2	-	-	3	18	**3577**
2002	58	2304	487	3	-	-	3	-	**2855**
TOTAL	**892**	**34931**	**4983**	**5088**	**27**	**1**	**94**	**47**	**42219**

Sou.ce: Knudsen 2003

* of Canada

P:\docbank\0320A03\reports\table 6-4 white-tailed deer stats GHA22.xls spring bear hunt, a hunt important to 3-4 outfitting companies in the region (Tirschmann *pers. comm.* 2003).

The area also potentially supports mule deer, a species listed as "threatened" by MESA (Manitoba Conservation 2003b; Appendix P, Table P-5). Although they are generally considered uncommon within the study area (Environment Canada *et al.* 2000), an estimated 12 mule deer reside within the area.

Moose are rare within the study area, with the occasional sighting occurring in the northern end of the Basin. Elk are more common (Tirschmann *pers. comm.* 2003).

6.5.3.2 Birds

Within the study area, there exists various types of aquatic and terrestrial habitats capable of potentially supporting approximately 230 avian species (see Appendix P, Table P-6). Diversity of wetland habitats within the study area enables the region to support an array of waterbird species. These include species vulnerable to human and natural disturbances, namely the Black-crowned Night Heron, American Bittern, Sandhill Crane, Yellow Rail, Franklin's Gull, Common Tern, Forster's Tern and Black Tern (Environment Canada *et al.* 2000).

Lake of the Prairies supports a number of migrating waterfowl in both the spring and fall. This lake is an important staging area for migrant geese, ducks, swans, pelicans and shorebirds. Due to its large size, this lake will support migrant waterfowl late into the fall season (until freeze-up; Tirschmann *pers.comm.* 2003).

Woodlands to the east of the study area support a number of terrestrial birds, including low numbers of Yellow-throated Vireos and Golden-winged Warblers (Environment Canada *et al.* 2000). Grasslands could potentially support the Baird's Sparrow, a species deemed at risk threatened by the *Manitoba Endangered Species Act* (MESA).

6.5.3.3 Amphibians and Reptiles

A total of five reptiles and six amphibians could potentially occur within the study area (see Appendix P, Table P-7; Preston 1982). For instance, the Red-sided Garter Snake may exist within riparian areas or adjacent wetlands typical of the study area (Environment Canada *et al.* 2000). Western Painted Turtles may occur within the more permanent wetlands, lake and rivers characteristic of the study area. As well, grasslands and moist woodlands would serve as ideal habitat for toads, salamanders and frogs.

6.5.3.4 Invertebrates

Limited information is available with respect to the terrestrial or aquatic invertebrate populations and ecosystems of the area.

6.5.4 Endangered Wildlife

The study area is not reported to contain any floral species deemed to be at risk by Environment Canada. Other species at risk of potentially occurring in the study area (Manitoba and Saskatchewan) as outlined by the *Species At Risk Act* (SARA), the Committee on the Status of Endangered Wildlife in Canada (COSEWIC), MESA, and The Wild Species at Risk Regulations (Saskatchewan) and their corresponding levels of risk are presented in Table 6-5.

6.6 SOCIO-ECONOMIC SETTING

6.6.1 Land Use Designations

There are 21 Rural Municipalities in Manitoba and 10 in Saskatchewan that are adjacent to or near the Assiniboine River (see Section 2.1). Major cities and towns along the Assiniboine River include the City of Winnipeg, the City of Brandon, the City of Portage la Prairie, the Town of Roblin, and the Town of Russell.

TABLE 6-5

CLASSIFICATION OF SPECIES POTENTIALLY OCCURING IN THE STUDY AREA

SCIENTIFIC NAME	COMMON NAME	SASKATCHEWAN			MANITOBA		
		SARA[1]	COSEWIC[2]	Species at Risk Regulations	SARA	COSEWIC	Manitoba Endangered Species Act
Lanius ludovicianus excubitoride	Loggerhead Shrike	T	T	-	T	T	E
Ammodramus bairdii	Baird's Sparrow	-	-	-	-	-	E
Falco peregrinus	Peregrine Falcon	T	T		T	T	E
Charadrius melodus	Piping Plover	E	E	E	E	E	E
Apodemia mormo	Mormon Metalmark	public consultation	T	-	public consulatation	-	-
Anthus spragueii	Sprague's Pipet	T	T	-	T	T	-
Ichthyomyzon castaneus	Chestnut Lamprey	SC	SC	-	SC	SC	-
Danaus plexippus	Monarch	SC	SC	-	SC	SC	-
Rana pipiens	Northern Leopard Frog	SC	SC	-	SC	SC	-
Asio flammeus	Short-eared Owl	SC	SC	-	SC	SC	-
Coturnicops noveboracensis	Yellow Rail	SC	SC	-	SC	SC	-

Source: SARA 2003, COSEWIC 2003, The Wild Species at Risk Regulations1999, Manitoba Endangered Species Act 1990

[1]- Species At Risk Act

[2]- Committee on the Status of Endangered Wildlife in Canada

T = Threatened
SC = Special Concern
E = Endangered

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There are nine Conservation Districts in Manitoba that include the Assiniboine River area: West Souris; Little Saskatchewan; Tiger Hills; Middle Assiniboine River; Whitemud; La Salle Redboine; Lake of the Prairies; Intermountain; and Upper Assiniboine River. Asessippi Provincial Park is a major camping and recreation destination located on the east side of the reservoir, just north of the Shellmouth Dam.

6.6.2 Population

There is a significant population in Manitoba and Saskatchewan that lives near, and relies on, the Assiniboine River for domestic water, wastewater treatment, irrigation, recreation, and tourism. Some of the Aboriginal communities on the Assiniboine River continue to rely on the river for sustenance fishing and on the surrounding area for hunting.

Table 6-6 provides a list of approximately 21 R.M.s in Manitoba and 10 R.M.s in Saskatchewan that are in the general area. Table 6-7 provides a list of 13 First Nations that report that they use the Assiniboine River.

6.6.3 Cottages and Recreation Use

The major cottage and recreational use of the study area occurs at Lake of the Prairies in Manitoba (Martz *et al.* 2002).

Lake of the Prairies has developed into a high-quality recreational walleye fishery and is considered one of the largest sport fisheries in Manitoba. The lake not only provides recreational opportunities for local anglers, but is also attracting an increasing number of non-residents, drawn to the area by its growing reputation. Noted for its walleye recreational fishery, in 1984 it was estimated that over 50,000 kg of walleye were removed from the reservoir (see www.lakeoftheprairies.com).

Asessippi Provincial Park (Figure 6-7) located along the south shore of Lake of the Prairies near Shellmouth dam, offers numerous recreational activities including swimming, boating, fishing, hiking, snowmobiling and cross country skiing. Table 6-8 indicates visitation experienced at

TABLE 6-6

RURAL MUNICIPALITIES IN SASKATCHEWAN AND MANITOBA NEAR TO THE ASSINIBOINE RIVER AND LIKELY AFFECTED BY THE SHELLMOUTH DAM

RURAL MUNICIPALITY	POPULATION
SASKATCHEWAN	
Cote	664
St. Philips	295
Livingston	427
Clayton	815
Keys	443
Sliding Hill	565
Calder	509
Churchbridge	772
Langenburg	647
Wallace	955
MANITOBA	
Cornwallis	3,779
Headingly	1,907
Miniota	969
Oakland	1,111
Portage la Prairie	6,791
South Cyprus	821
South Norfolk	1,246
S. Francois Xavier	1,024
Victoria	1,181
Wallace	1,547
Hamiota	479
Woodsworth	939
Russell	544
Shellmouth-Boulton	946
Ellice	509
Silver Creek	532
Archie	378
Birtle	749
Hillsburg	470
Shell River	991
Roblin	955

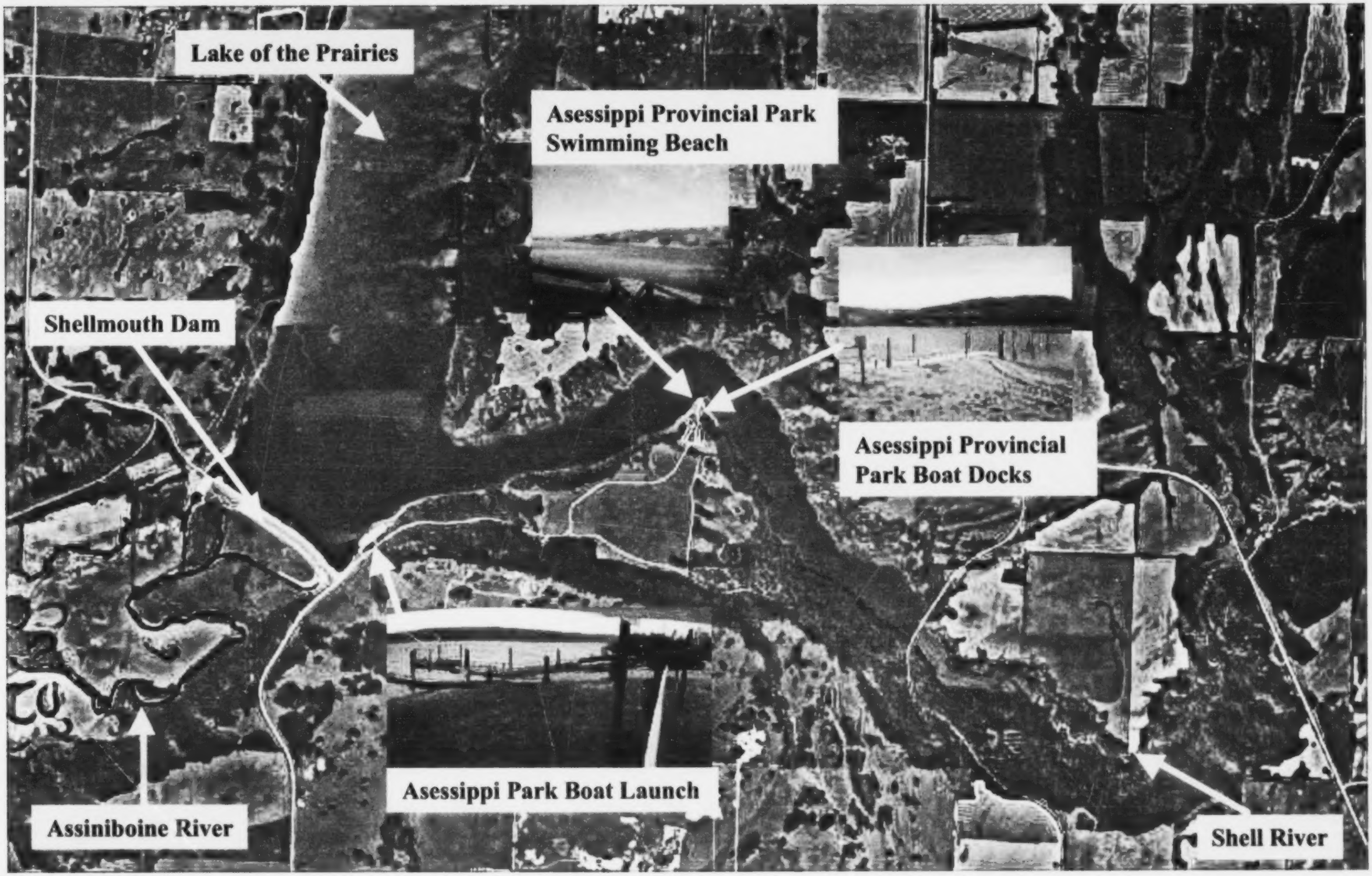
Source: Manitoba Intergovernmental Affairs (2004);
Saskatchewan Government Relations and Aboriginal Affairs (2004)

TABLE 6-7

MANITOBA AND SASKATCHEWAN FIRST NATIONS ADJACENT TO, OR USING, THE ASSINIBOINE RIVER

FIRST NATIONS
SASKATACHEWAN
Cote First Nation
Key First Nation
Keeseekoose First Nation
MANITOBA
Birdtail Sioux First Nation
Long Plain First Nation
Sioux Valley First Nation
Canupawakpa First Nation
Waywayseecappo First Nation
Dakota Tipi First Nation
Swan Lake First Nation
Tootinaowaziibeeng First Nation
Gamblers Tipi First Nation
Dakota Plains First Nation

Source: Pierre *pers. comm.* 2003.


Lake of the Prairies
Asessippi Provincial Park Swimming Beach
Shellmouth Dam
Asessippi Provincial Park Boat Docks
Assiniboine River
Asessippi Park Boat Launch
Shell River

TetrES CONSULTANTS INC.

Asessippi Provincial Park
Figure 6-7

TABLE 6-8

VISITATION EXPERIENCED AT ASESSIPPI PROVINCIAL PARK

YEAR	VEHICLES	PEOPLE[1]
1999	21,065	73,727
2000	19,636	68,726
2001	17,622	61,677
2002	14,902	52,157
2003	17,618	61,663

[1] calculated based on conversion factor of 3.5 persons/vehicle

Source: Novak *pers. comm.* 2003

Asessippi Provincial Park from May until September for the past 5 years. With "natural areas" such as Asessippi Provincial Park and Riding Mountain National Park providing a continuous draw of people to the area, the aquatic aspect of tourism is an important component of ongoing resource use (Thompson *pers. comm.* 2003).

Recent developments, like the Asessippi Ski Hill (Figure 6-8) and ongoing recreation oriented businesses like Kilman Resorts (Figure 6-9), demonstrate a growing recreational industry on the Lake of the Prairies (Thompson *pers. comm.* 2003).

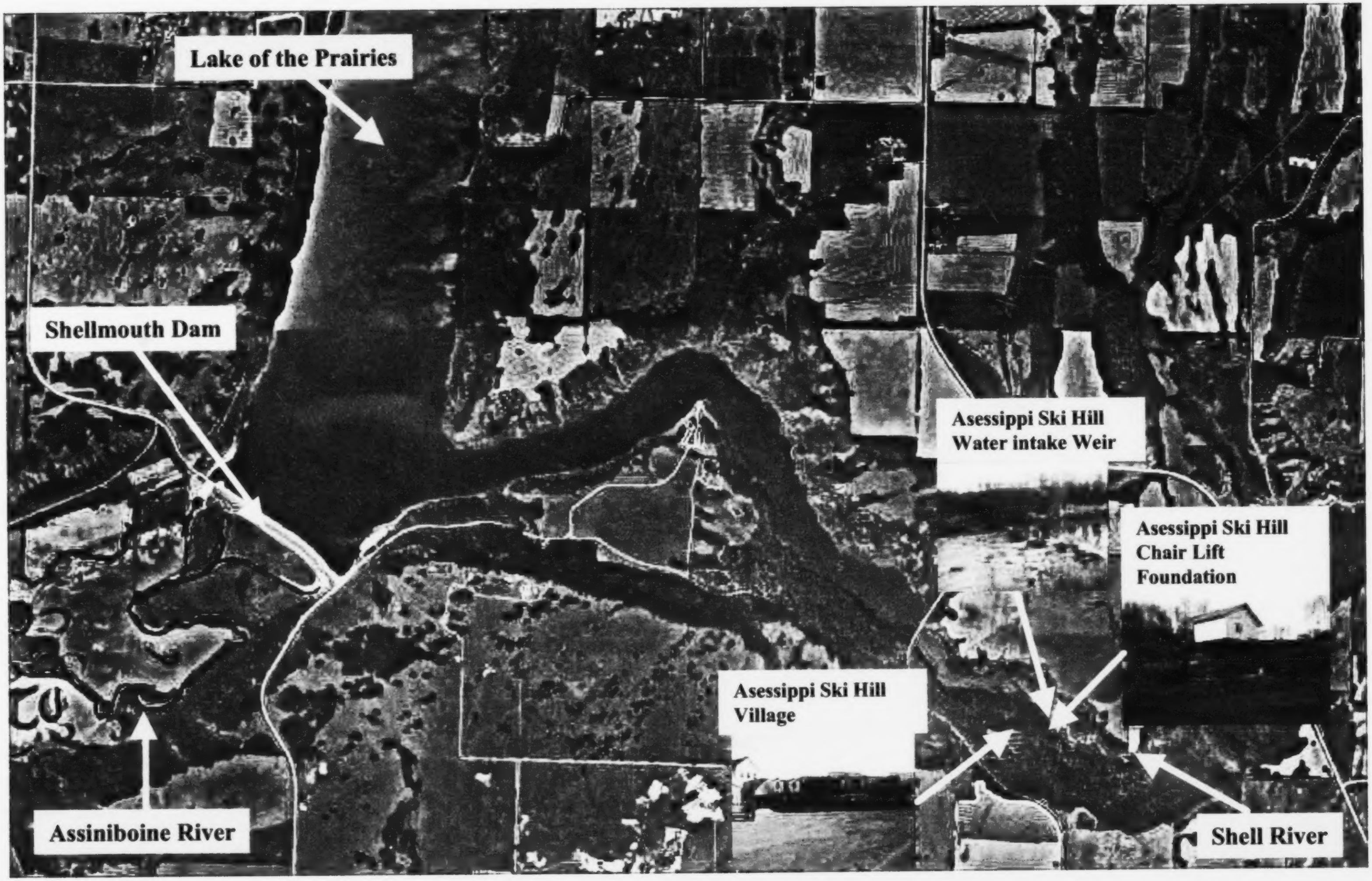
Cottage development on Lake of the Prairies is limited, but has recently experienced considerable growth and expansion in Manitoba (Figures 6-10, 6-11 and 6-12). On the Saskatchewan side of the reservoir however, no cottage development has occurred and historic recreational use of the reservoir, particularly at the picnic/campground near the Togo bridge crossing has declined (Harron *pers. comm.* 2003).

6.6.4 Bridges

With respect to Lake of the Prairies, the Upgrade could affect existing crossings upstream of the Shellmouth Dam, which includes a number of bridge structures (Figure 6-12).

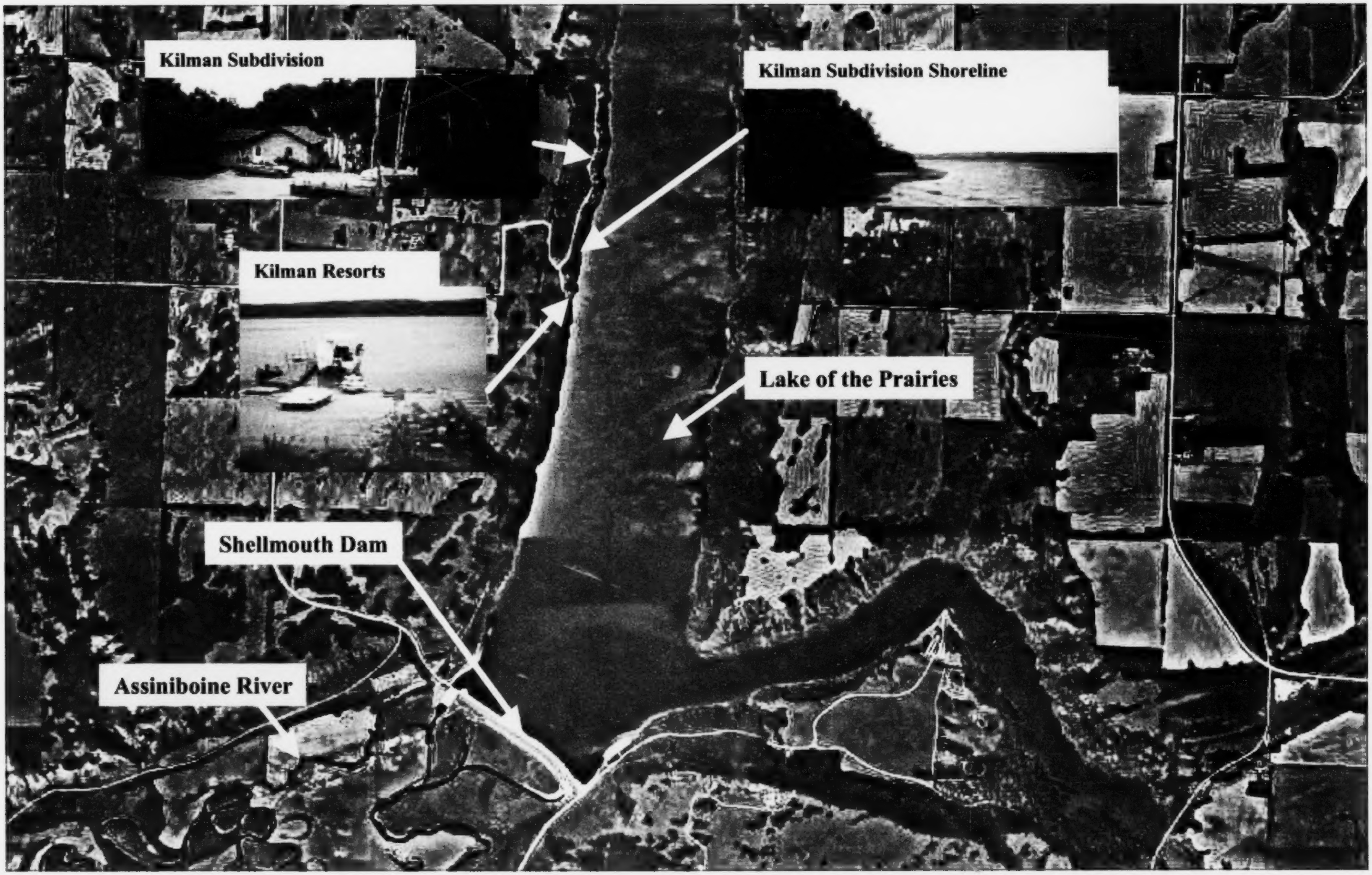
6.7 SCHEDULE

Figure 6-1 illustrates a typical conceptual schedule for an environmental impact assessment and to obtain an *Environment Act* license for an Upgrade to the Shellmouth Dam. It is considered highly unlikely that a thorough and credible EIA on the proposed Upgrade can be completed if less than 10 months is allocated for the EIA process.


Lake of the Prairies
Shellmouth Dam
Asessippi Ski Hill
Water intake Weir
Asessippi Ski Hill
Chair Lift
Foundation
Asessippi Ski Hill
Village
Assiniboine River
Shell River

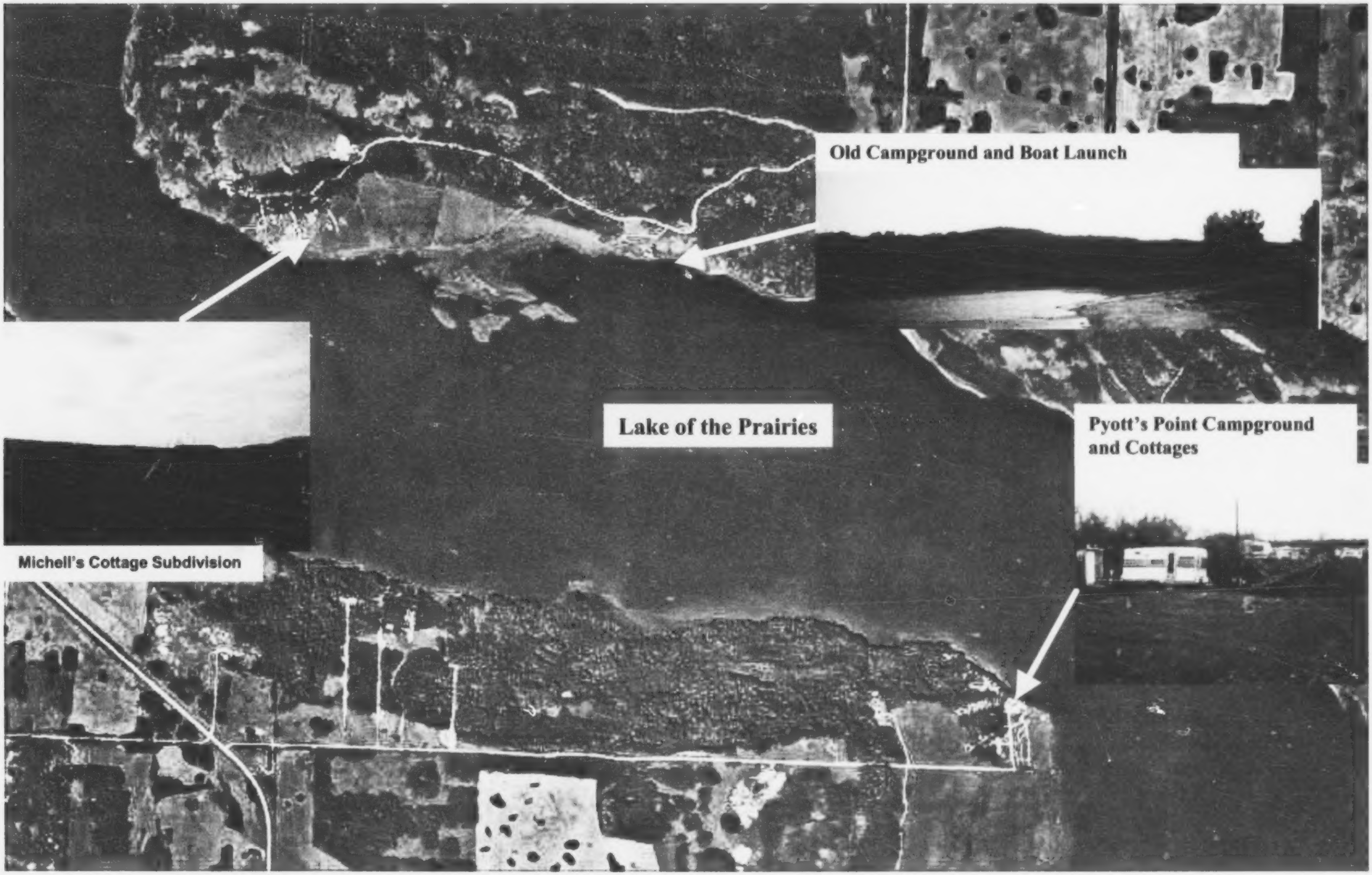
Asessippi Ski Hill
Figure 6-8

TetrES
CONSULTANTS INC.


Kilman Subdivision
Kilman Subdivision Shoreline
Kilman Resorts
Lake of the Prairies
Shellmouth Dam
Assiniboine River

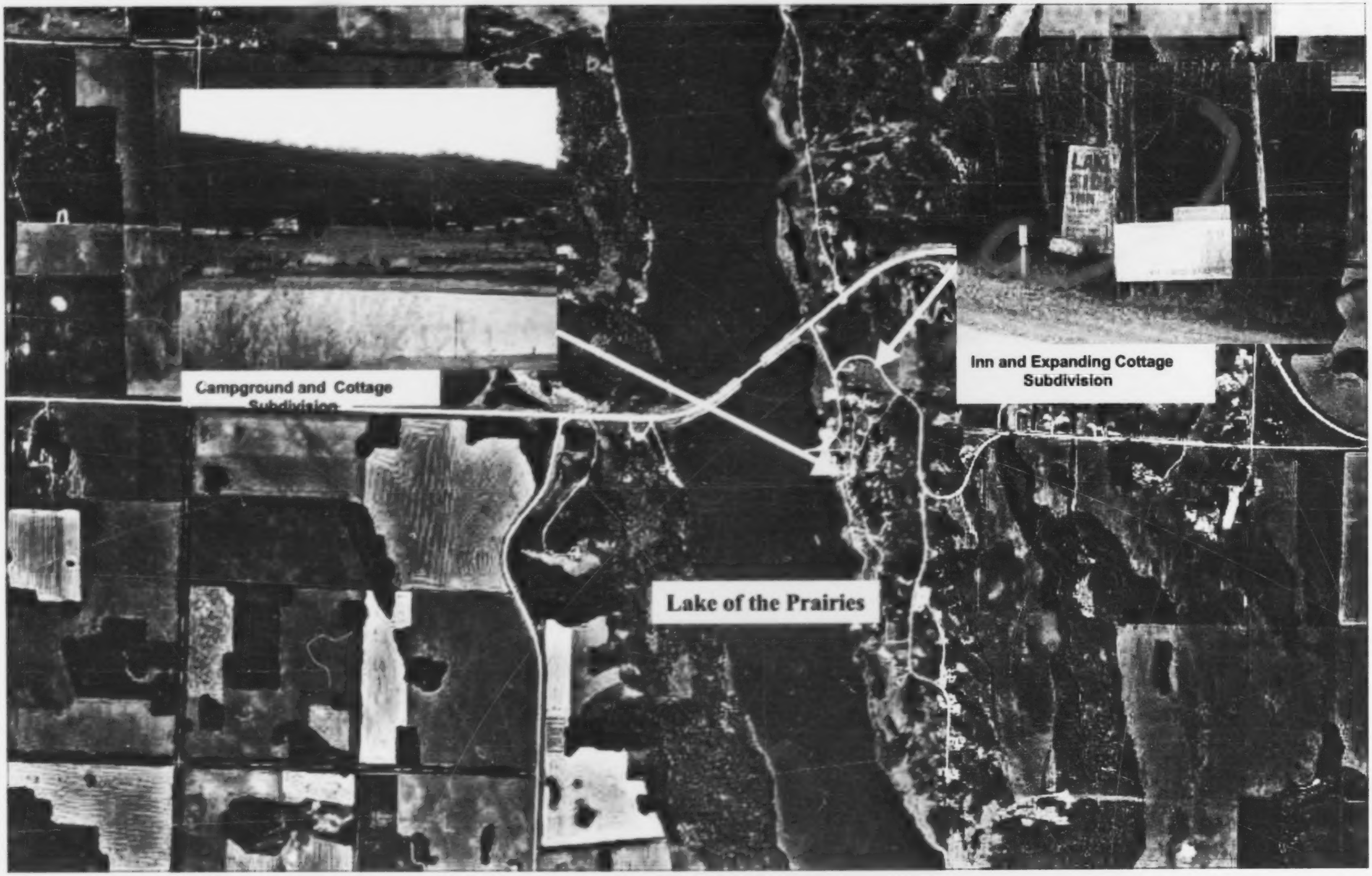
TetrES
CONSULTANTS INC.

Kilman Subdivision and Kilman Resort
Figure 6-9


Old Campground and Boat Launch
Lake of the Prairies
Pyott's Point Campground and Cottages
Michell's Cottage Subdivision

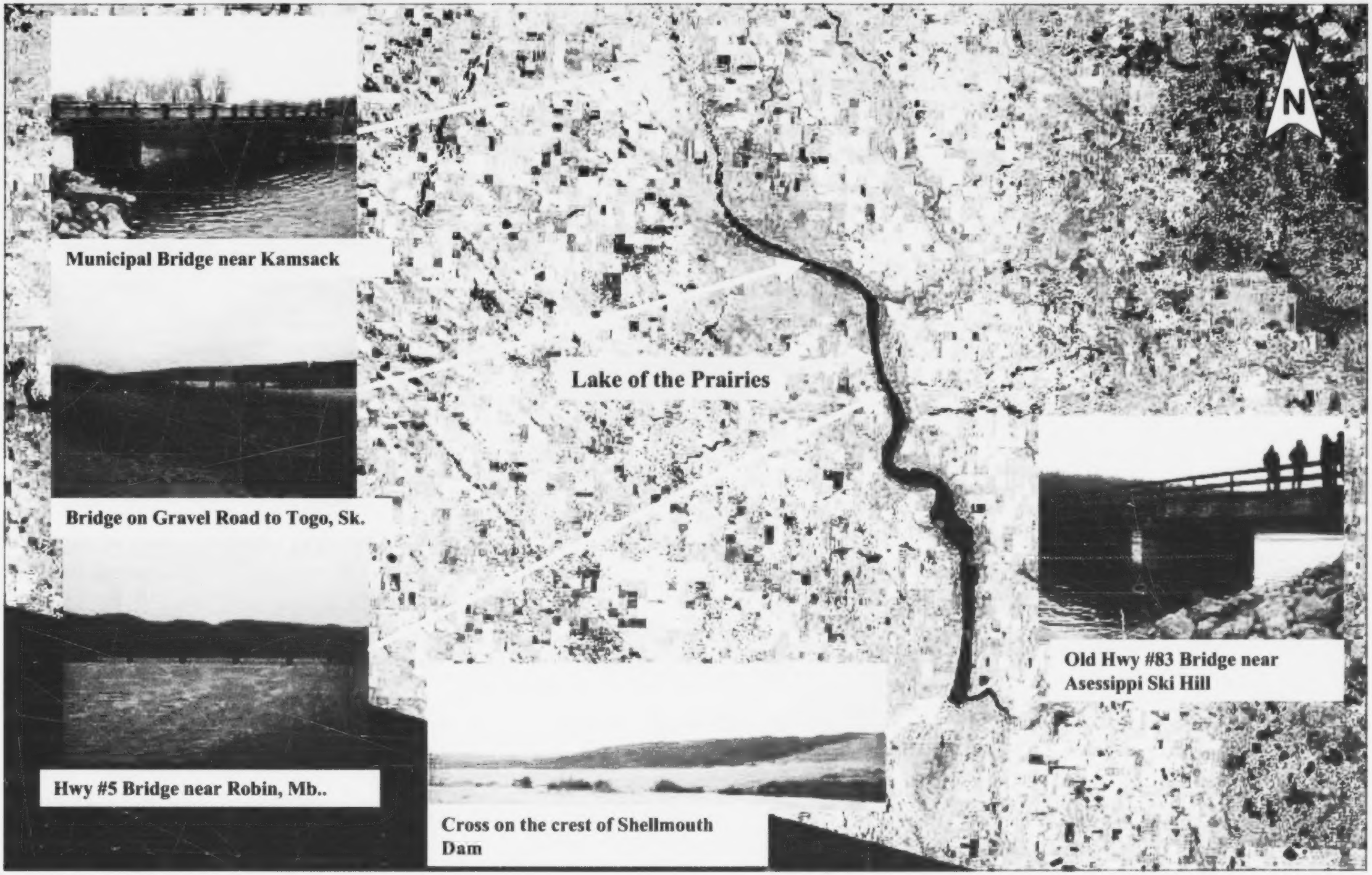
TetrES
CONSULTANTS INC.

Cottage and Campground Developments
Figure 6-10


Campground and Cottage Subdivision
Inn and Expanding Cottage Subdivision
Lake of the Prairies

Lakeside Cottage and
Campground near
Hwy #5 Bridge
Figure 6-11

TetrES
CONSULTANTS INC.


Municipal Bridge near Kamsack
Bridge on Gravel Road to Togo, Sk.
Hwy #5 Bridge near Robin, Mb..
Lake of the Prairies
N
Old Hwy #83 Bridge near Asessippi Ski Hill
Cross on the crest of Shellmouth Dam

Typical Bridges On and Upstream of Lake of the Prairies
Figure 6-12

TetrES
CONSULTANTS INC.

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APPENDIX A
Shellmouth Dam Meeting Invitation Letter

Canada - Manitoba Shellmouth Dam Consolidation Agreement
Entente de consolidation Canada - Manitoba sur le barrage Shellmouth

November 20, 2003

Agriculture and Agri-Food Canada
Prairie Farm Rehabilitation Administration
Manitoba Region
200-303 Main Street
Winnipeg, Manitoba
R3C 3G7

Dear

You are invited to meet with the Agreement Steering Committee to discuss proposed changes to the works and operations of Shellmouth Dam. A series of meetings has been scheduled with groups and individuals who may have an interest in the project to gather input on potential issues related to the proposed upgrade. Please attend the Local Manitoba Government (south) Group meeting in Portage La Prairie, Manitoba, at 9:00 a.m. on November 26, 2003, if you are available. A complete list of meeting dates, locations and groups is provided below if you are not available to meet at the above suggested place and time.

The Government of Canada and the Province of Manitoba plan to address anticipated future water supply concerns along the Assiniboine River by upgrading the Shellmouth Dam to allow for operation at higher levels of water in Lake of the Prairies. Improvements to the dam would provide increased water supply and flood control benefits.

The proposed Shellmouth Dam upgrading is one of four initiatives under the Canada-Manitoba Shellmouth Dam Consolidation Agreement. The other three initiatives are compensation for past damages to upstream farmers, additional upstream land control, and study of downstream impacts due to reservoir operations. Agreements for past damages to upstream farmers and additional upstream land control have been negotiated. The study on downstream impacts due to reservoir operations is just getting underway.

The Prairie Farm Rehabilitation Administration of Agriculture and Agri-Food Canada and Manitoba Water Stewardship engaged Tetr*ES* Consultants Inc. to facilitate public involvement in identifying environment-related issues in advance of project decisions and environmental assessment. Tetr*ES* will attend each of the meetings to assist the Steering Committee in "scoping" potential issues related to the proposed upgrading.

Preliminary engineering investigations have just begun and final project decisions are not anticipated to be made until late 2004 or early 2005. Broader public consultations are to be included in the environmental assessment planned to begin in 2004 (i.e., in advance of final project decisions being taken).

Please confirm attendance at the suggested or alternate time and location to Lisa Hardess or William Weaver of Tetr*ES* at (204) 942-2505. You may forward this letter to other people who may be interested in attending the meetings. If you are unable to attend any meeting and wish to find out more about the proposed upgrading to the Shellmouth Dam, please call the undersigned at (204) 983-3627. It is important for the Steering Committee to receive your opinion verbally or in writing.

Sincerely,

Anthony J. Kettler
Project Manager
PFRA Manitoba Region

SHELLMOUTH DAM MEETINGS SCHEDULE

DATE & TIME	LOCATION	GROUP
Wednesday, November 26, 2003 9:00 a.m. to noon	Canad Inn 2401 Saskatchewan Avenue Portage la Prairie, MB	Local Manitoba Government (southern)
Wednesday, November 26, 2003 1:30 p.m. to 5:00 p.m.	Canad Inn 2401 Saskatchewan Avenue Portage la Prairie, MB	Agricultural Organizations/Irrigators
Thursday, November 27, 2003 9:00 a.m. to 12:00 p.m.	Agriculture and Agri-Food Canada Brandon Research Centre 18th Street and Grand Valley Road Brandon, MB	Downstream Users
Monday, December 1, 2003 3:00 p.m. to 6:00 p.m.	Crowstand Building, Room 204 241 Second Street Kamsack, SK	Local Saskatchewan Government
Tuesday, December 2, 2003 9:00 a.m. to noon	Russell and District Community Centre 106 Shell River Avenue S. Russell, MB	Local Manitoba Government (northern) & Downstream Residents
Tuesday, December 2, 2003 2:00 p.m. to 5:00 p.m.	Russell and District Community Centre 106 Shell River Avenue S. Russell, MB	Local Interests/Groups (farmers, cottagers, fishers, skiers etc.)
Monday, December 8, 2003 7:00 p.m. to 10:00 p.m.	Russell and District Community Centre 106 Shell River Avenue S. Russell, MB	General Public
Wednesday, December 10, 2003 9 a.m. to noon	Manitoba Conservation Boardroom A, 200 Saulteaux Crescent Winnipeg, MB	Manitoba Government Water Issues TAC (standing committee)
Wednesday, December 10, 2003 7:00 p.m. to 10:00 p.m.	Winnipeg Convention Centre 375 York Avenue Winnipeg, Manitoba	Environmental Organizations
Monday, December 15, 2003 1:30 p.m. to 5:00 p.m.	Canad Inn 2401 Saskatchewan Avenue Portage la Prairie, MB	Local Manitoba Government (southern)

APPENDIX B
Shellmouth Dam Meetings Participant Lists

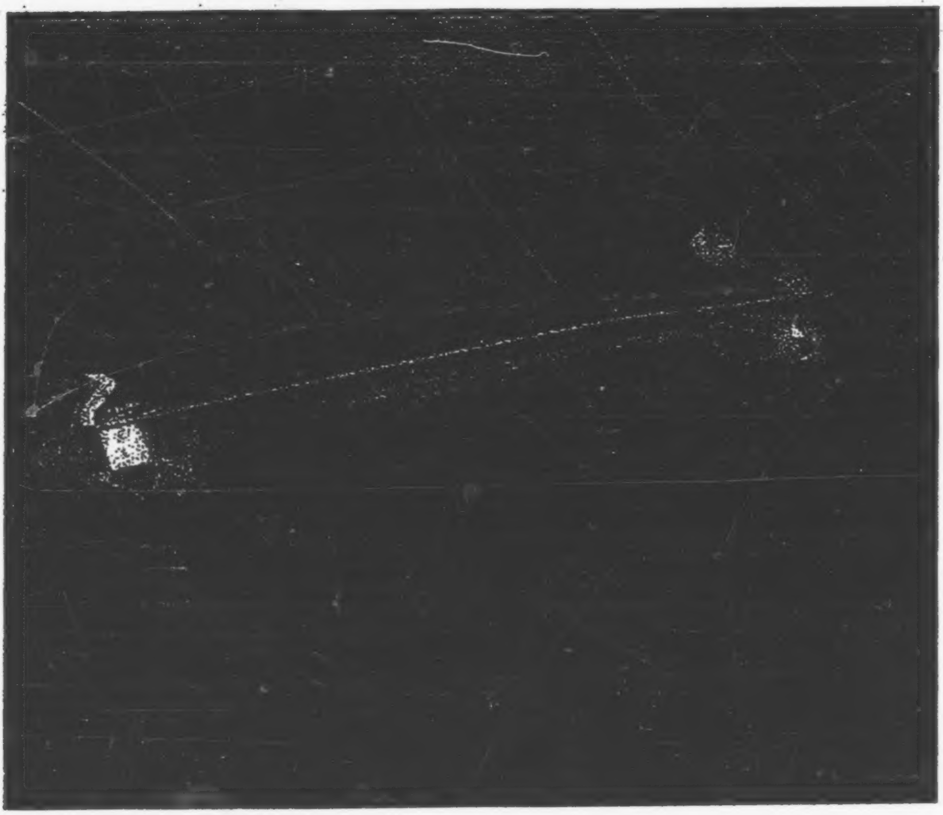
MEETING DATE	NAME	AFFILITATION
November 26 a.m.		
	Wayne Wall	City of Portage la Prairie
	John Zyla	PFRA Beausejour
	Brian Beyak	MB Highways and Transportatoin
	Kelly Braden	City of Portage la Prairie
	Ian Wishhart	Keystone Agricultural Producers
	Erminio Caligiuri	PFRA
	Rick Baker	Whitemud Conservation District
	Doug Campbell	City of Portage la Prairie
November 26, p.m.		
	Jim Moorhouse	Vegetable Growers Assoc.
	Doug Smallwood	Assoc. of Irrigators in Man. (AIM)
	David Henry	KVPA & Irrigator
	Barry Routledge	Assiniboine Valley Producers
	Garry Sloik	Keystone Veg. Prod. Assoc. (KVPA)
	Tim Sawatzky	AIM CMRM Central MB Resource Management
	Don Rioux	McCain Foods
	Dale Ziprick	McCain Foods (AIM)
	Chris Ingram	McCain Portage Farm
	Don Loewen	AIM and CMRM
	Rod McLaren	AIM
	Todd Griffin	AIM, Mayfair Farm, UGAM
November 27, a.m.		
	Kevin Croteau, MLP	6355 Richmond Ave East
	Bill McQuaker	RM Woodworth
	Professor Bill Paton	Brandon University
	Professor Rod McGinn	Geography Dept., Brandon University
	Janessa Champagne	Botany Dept., Brandon University
	Keith Pearn	Assiniboine Valley Producers
	Rob Chapman	Assiniboine Valley Producers
	Fred Taylor	Assiniboine Valley Producers
	Scott Lawrence	Manitoba Transportation
	Chris Hayhurst	Simplot
	Ray Redfern	Redfern Farm Services Ltd.
	Bob Mazer	Sundance Enterprises/Mazur Improvement
	Lu Bulks	PFRA
	Ron Cherepuschek	WYETH
	Steve Trivett	WYETH
	Bill Turner	NEXEN
	Bruce Bunting	NEXEN
	Bob Dandenault	Manitoba Hydro
	Terry Pearce	Intergovernmental Affairs and Trade
	Ian Christiansen	City of Brandon
	Ted Snure	City of Brandon
	Bob Hyre	Midwestern Foods
	Lawrence Anderson	Farmer
December 1, p.m.	Frank Skilnick	Sask. Highways
	Kelly Hladun	Farmer
	Walter Hladun	Farmer
	Vern Bowes	Farmer/R.M. Councillor
	James Konkin	
	Don Timoruski	Jackfish camp
	Melvin Woloschuk	
	Richard Dahlin	Department of Highways
	Tom Zeiben	
	Jim Waggoner	Sask. Watershed Authority
	Gordon Bue	SK Agriculture, Food & Rural Revitalization
	John Hauer	SK Agriculture, Food & Rural Revitalization
	Bill Dutcheshen	Land Owner

MEETING DATE	NAME	AFFILITATION
	Rona Seidle	R.M. of Cote
	Gerald Schepp	R.M. of Calder
	Dennis Elaschuk	R.M. of Calder
	Gene Nerbas	Shellmouth Farmer
	Ken Waldherr	R.M. Churchbridge
	Peter Cherkas	Farmer
	Randy Seguin	Sask. Environ
	Mayor Pamela Nykolaishen	Town of Kamsack
December 2, a.m.	Merv Safronet	Town Office
	Mayor Lorne Boguski	Town of Roblin
	Wayne Kozmeniuk	Town of Roblin
	Jeff Howard	Upper Assiniboine River Conserv. Dist
	Inky Mark	MP, Dauphin-Swan River
	Kelvin Nerbas	R.M. Shellmouth Boulton
	John Hunter	R.M. Shellmouth Boulton
	Geo Boucher	R.M. of Ellice
	Dale Rands	R.M. Shell River
	Albert Nabe	R.M. Shell River
	Thomas Judd	R.M. Archie
	George Harrison	R.M. Sifton
	Marvin Elder	R.M. of Woodworth
	Dennis Griffith	R.M. Sifton
	W. Wetiner	
	Elaine Gauer	MAFRI (MB Ag & Food)
	Gene Nerbas	Shellmouth
	Deruy English	
	Kevin Mazur	R.M. of Silver Creek
	Robert Muir	R.M. of Russell
	Miles Glassman	Downstream land owner
December 2, p.m.		
	Pat Waller	Landowner/Woodworth, R.M.
	Annette Mansell	Kilman Resort co-Owner
	Marcia Rowal	Pelly Trail Enon. Dev
	Gene Nerbas	Shellmouth
	Rick Keag	
	Ken Michalchuk	cottage subdivision
	B. Fontro	landowner Woodworth
	Graeme Olson	R.M. of Shell River
	John Wythe	
	Gary Gordon	Pyotts East Cottage owner
	Senas Keating	Prairie Lake Lodge development
	Lorne Kilkenny	Killman Resort and cottage owner
	Eldon Montgomery	Town of Russell
	Les Brown	landowner
	Randy Kochanowski	landowner
	Dennis Chase	homeowner
	Elwood & Terry Kotzer	landowners
	Wayne & Sylvia Ricker	Ricker's Campground
	Lynn & Dave Trefchak	landowners
	Len Leland	landowner
	Rudy Bewer	Landowner/Woodworth, R.M.
	Bill Dayson	Ski Hill - Assessippi
	Ed Birdley	landowner
	Jim Mansell	Kilman Resort
	B.A. Mehrer	Kilman Resort/landowner
	Greg Haas	cabin owner
	David Lundgris	cabin owner
	Barbara Barksley	Lake of the Prairies cottage subdivision
	Norman Hedison	cottage owner, Lake of the Prairies cottage subdivision
	Ken Armitage	Farmer
	Jake Daas	Valley, Langenberg
	Bill Clark	R.M. of Miniota
	Ellen Robertson	R.M. of Shell River
	Reg Robertson	R.M. of Shell River
	Kim Marschall	landowner, 2 miles below dam
	M.J. Wileman	landowner below dam
	Kelvin Nerbas	R.M. of Smellmouth
	Garry Buick	R.M. of Shell River
	Jack McKinny	Lake of Prairies cottage owner

MEETING DATE	NAME	AFFILITATION
	LaVonne & Roy Graham	Lake of Prairies cottage owner
	Jim Vassart	Lake of Prairies cottage owner
	Myra Kilkenny	Lake of the Prairies, Kilman Resort owner
	Gerald Mehrer	Lake of the Prairies, Kilman Resort owner
December 8, p.m.		
	Leonard ???oroneski	
	Bob Schmidt	
	Ritchie Davidson	
	Richard ???	
	Ron Witty	
	Cindy Kochinowski	landowner, Shellmouth
	Joe Dugar	
	Joe Poitras	
	Reeve Alvin Zimmer	Shellmouth Boulton
	Lorna & Gordon Keene	Shellmouth
	Alan Kingdon	RM of Russell
	Chuck Lund	MB Transportation
	Neil Meher	Churchbridge R.M.
	William Shipp	Shellmouth
	Brad Robin	
	Al Johnson	
	B.J. Byrton	
	R. Kinliness	Sask. Watershed Authority
	Gerald Mehrer	
	Gordon Munsch	
	Ron Gares	PFRA
	P. Malsyt	cottager
	Dale Wondraser	RM Russell
	Marsha Trinder	Millwood
	Robb Halwa	
	Cynthia Nerbas	
	Don Werle	
	Chris Redford	Town of Russell
	Doug Buz	
	Lynn Spurway	Russell
	Daymon Guilles	Russell Inn
December 10, p.m.		
	Dave Crabb	VP MACA
	Glen Koroluk	
	Shirley Thompson	NRI University of Manitoba
	Doug Neal	Man. Assoc. Cottage Owners
	Liz Dykman	MB Eco-Network
December 15, p.m.		
	Tom Kelly	R.M. South Norfolk
	Jim Knight	R.M. Portage la Prairie
	Jack Hamilton	R.M. South Cypress
	Roy Davidson	R.M. Portage
	Bill Alford	R.M. of Portage
	Terry Martin	R.M. of Portage
	Ron Roteliuk	Central Plains Inc
	Tyler MacAfee	AMM
	Gene Nerbas	Shellmouth
	Emil Egert	R.M. of Cornwallis
	Earl Malyon	South Cypress
	Owen Gillum	
	Toby Turmble	R.M. of Portage
	Nally Durcharm	R.M. of Portage
	Bob Thiessen	R.M. of St. Francois
	Les Ferris	R.M. Victoria
	Rick Lock	R.M. of Portage la Prairie
	Lorne Henry	Portage Irrigators
	Dan MacKinvar	
	Leslie Bryde	Daily Graphic
Others (meeting/mail / email / phone call to Steering Committee / Study Team)		
	Keith Pearn	Chairman, Assiniboine Valley Producers Committee

MEETING DATE	NAME	AFFILITATION
	Mark Myrowich	ErosionControlBlanket.com
	Sam Schellenberg	Pembina Valley Water Cooperative Inc.
	Spencer Reavie, Lloyd McKinney, Lynn Spurway	Ski Asessippi Ltd. Partnership
	Frank Skilnick	Saskatchewan Highways and Transportation, Central Region
	Ken Altman	landowner; Kliman cottage development
	Garry R. McIntosh	Secretary Treasurer, Lake of the Prairies Development Ltd., Pyott's West Campground
	Kelvin Nerbas	Councillor R.M. of Shellmouth-Boulton; landowner
	John Hunter	Councillor R.M. of Shellmouth-Boulton; landowner; tenant Pyott's West Campground
	Kelly Hladun	landowner, Saskatchewan
	Walter Hladun	landowner, Saskatchewan
	William Clark	Reeve R.M. of Miniota
	Eldon Montgomery	Russell
	N.C. Hedison	cottage owner, Lake of Prairies
	Dave Fefchak	landowner, R.M. of Woodworth
	anonymous	Langenburg, SK
	anonymous	Inglis
	Betty Wileman	Russell, Manitoba
	T. Pearce	Intergovernmental Affairs and Trade, Brandon
	Gordon Hensch	Langenburg, SK
	Del Stainer	cottage owner
	Dennis & Carole Chase	landowner, R.M. of Shell River
	Joe Dugar	landowner, Roblin
	Bob Schmidt	farmer, landowner, Russell
	Gene Nerbas	Site meeting with farmers
	Ken and Karen Michalchuk	landowner
	Fred Taylor	landowner
	Gaile Whelan-Enns	Canadian Nature Federation
	Glen Koroluk	Manitoba Econetwork
Steering Committee meetings/e-mail/phone calls with Government Department representatives		
	Darryl Chudobiak	DFO Dauphin
	Joel Hunt	MB Conservation
	Chuck Lund	MTGS Dauphin
	Bruce Wright	MB Conservation
	Dan Laychuk	MB Conservation
	Bruce Mitchell	MB Conservation
	Bill Franzin	DFP Winnipeg
	Don Jacobs	MB Conservation
	Jack Dean	MB Conservation
	Rod McFadyen	MB Conservation
	Bill Tichon	MB Conservation
	Lome Mesarideb	MB Conservation
	Pete Hildebrand	MB Conservation
	Ken Kansas	MB Conservation
	Perry Stonehouse	Water Stewardship
	Brian Yake	Water Stewardship
	Terry Yeomans	Environment Canada
	Angela Bidinosti	INAC
	Dan McNaughton	Canadian Environmental Assessment Agency
	Kristina Farmer	Canadian Environmental Assessment Agency
	Randy Seguin	Saskatchewan Environment
	Frank Skilnick	Saskatchewan Highways
	Len Frass	Saskatchewan Highways
	Nick Szoe	City of Winnipeg

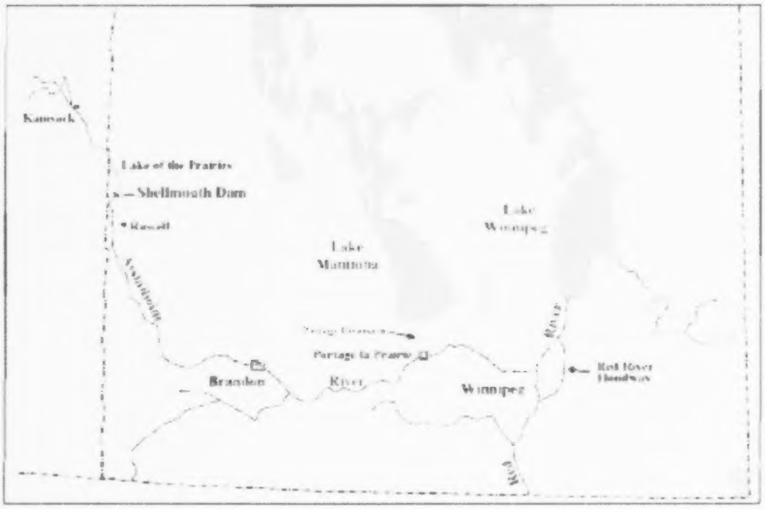
APPENDIX C
Public Meeting Storyboards



CANADA – MANITOBA
SHELLMOUTH DAM PROJECT

CANADA – MANITOBA
SHELLMOUTH DAM PROJECT
WELCOME!

Manitoba
Canada



Kamsack
Lake of the Prairies
Shellmouth Dam
Russell
Lake Manitoba
Lake Winnipeg
Assiniboine
Portage Diversion
Portage la Prairie
Brandon
River
Winnipeg
River
Red River Floodway
Red

Manitoba

Canada

HISTORY

• 1962	Fed/Prov $7.5 million agreement to construct dam
• 1970	PFRA completed dam construction
• 1975	Manitoba assumed ownership/operation
• 1976	Reservoir impacts on upstream farms confirmed
• 2003	Fed/Prov **$8.0 million agreement** for upstream damages, upstream land control, Shellmouth capacity upgrading, downstream studies

Manitoba

Canada

CANADA – MANITOBA SHELLMOUTH DAM CONSOLIDATION AGREEMENT (JANUARY 2003)

- Agreement includes $4 Million to improve Shellmouth water management
- Other areas receiving funding to address existing issues, including:
  - Compensation to upstream landowners;
  - Upstream land control; and
  - Study downstream impacts

Manitoba

Canada

NEED FOR IMPROVED WATER SUPPLY & MANAGEMENT

- Assiniboine River water use has increased in the last decade
- Increased future water demands are likely from:
  - agricultural (e.g., irrigation);
  - municipal (e.g. water treatment); and
  - industrial (e.g. food processing) sources
- Maintenance of minimal flows necessary to preserve a healthy ecosystem

GOALS

Enhance flood control and provide additional water storage for downstream use

- 1992 report recommended spillway gates to allow for operation of the reservoir at higher water-surface elevations
- need to investigate a range of options to acquire additional storage for downstream water supply and flood protection

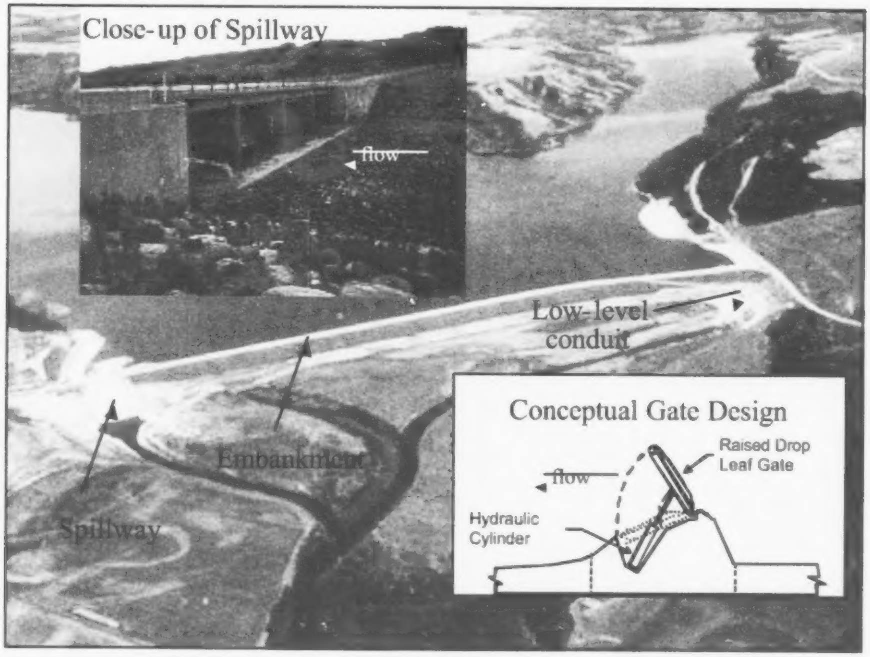
SHELLMOUTH DAM IMPROVEMENT

Engineering Studies

- Dam safety analysis
- Gates and other options
- Shellmouth Operating Rules
- Upstream and downstream hydraulic impacts

Manitoba

Canada


Close-up of Spillway
flow
Low-level conduit
Embankment
Spillway
Conceptual Gate Design
Raised Drop Leaf Gate
flow
Hydraulic Cylinder

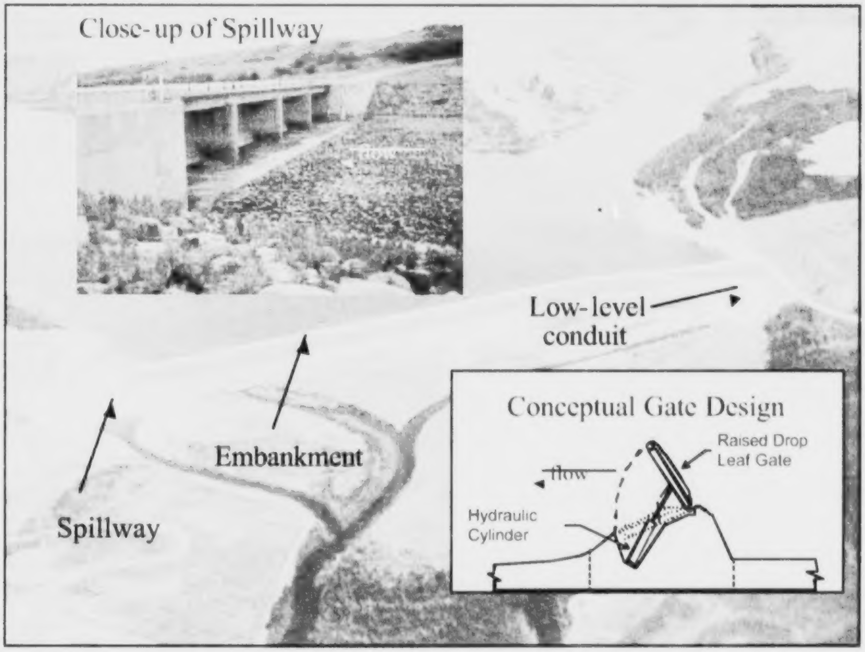
SHELLMOUTH DAM IMPROVEMENT

Engineering Studies

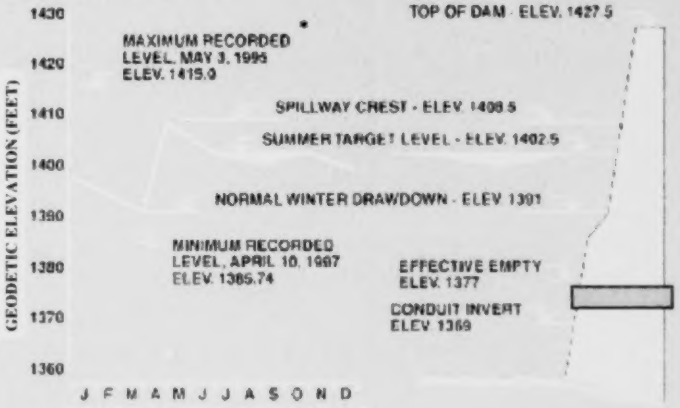
- Dam safety analysis
- Gates and other options
- Shellmouth Operating Rules
- Upstream and downstream hydraulic impacts

Manitoba

Canada


Close-up of Spillway
Low-level conduit
Embankment
Spillway
Conceptual Gate Design
Raised Drop Leaf Gate
flow
Hydraulic Cylinder

Manitoba Conservation



EXISTING CONDITION

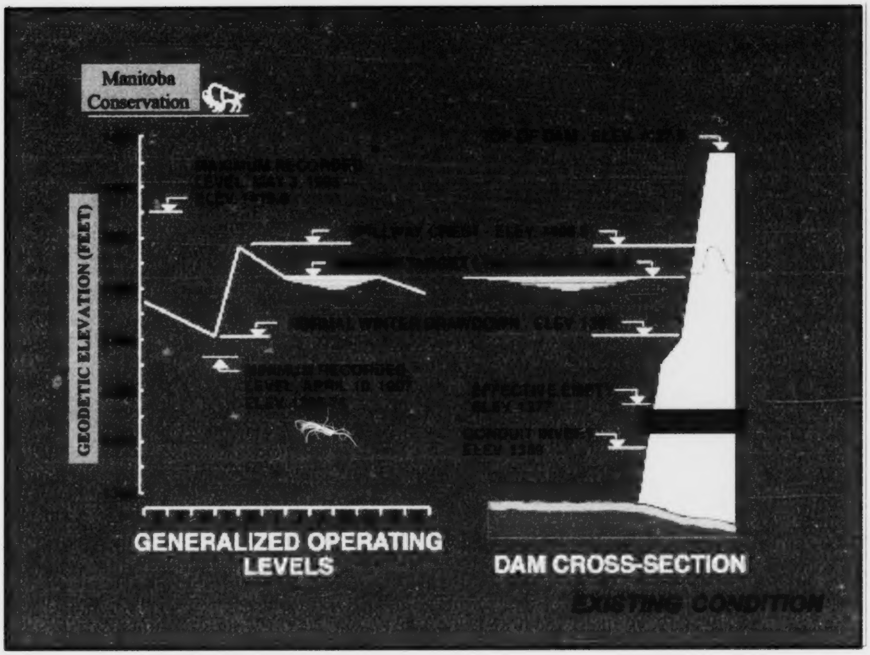
SHELLMOUTH DAM IMPROVEMENT cont'd

Environmental Studies

- Public dialogue and input
- Aboriginal dialogue and input
- Needs and alternatives
- Environmental, social, economic impacts
- Mitigation strategy

Manitoba

Canada


Manitoba Conservation
GEODETIC ELEVATION (FEET)
TOP OF DAM
MAXIMUM RECORDED LEVEL
SPILLWAY CREST
NORMAL WINTER DRAWDOWN
MINIMUM RECORDED LEVEL, APRIL 10, 1987
EFFECTIVE EMPTY
CONDUIT INVERT
GENERALIZED OPERATING LEVELS
DAM CROSS-SECTION
EXISTING CONDITION

SHELLMOUTH DAM IMPROVEMENT cont'd

Environmental Studies

- Public dialogue and input
- Aboriginal dialogue and input
- Needs and alternatives
- Environmental, social, economic impacts
- Mitigation strategy

Manitoba

Canada

PROJECT SCHEDULE

Agreement Completion Date
March 31, 2006

	- public consultations to be ongoing	------------------		
	- organize, hire consultants	fall	2003	
★	- scoping study	fall	2003	★
	- dam safety	summer	2004	
	- preliminary engineering	fall	2004	
	- environmental assessment	spring	2005	
	- implementation of works	------------------		

Manitoba

★ *We are here!*

Canada

WHAT IS AN ENVIRONMENTAL SCOPING STUDY?

- Preliminary study of potential issues (e.g., environmental, socio-economic, etc.)
- Public identification of issues and public input to alternatives will contribute to Project decisions
  - issues raised and input provided in these meetings will be considered in an Environmental Impact Assessment
  - Environmental Impact Assessment will be concluded after preliminary engineering studies have been completed, a project scheme has been selected, and the public has been consulted once again

Manitoba

Canada

PUBLIC INVOLVEMENT

Ongoing dialogue for
the duration of the project

- Local Public (e.g., recreational groups, outfitters, etc.)
- Upstream Interests (e.g., landowners, Kamsack, etc.)
- Downstream Interests (e.g., farmers, cities, RM's, etc.)
- First Nations
- General Public
- Other communications (e.g., media, newsletter)

Manitoba

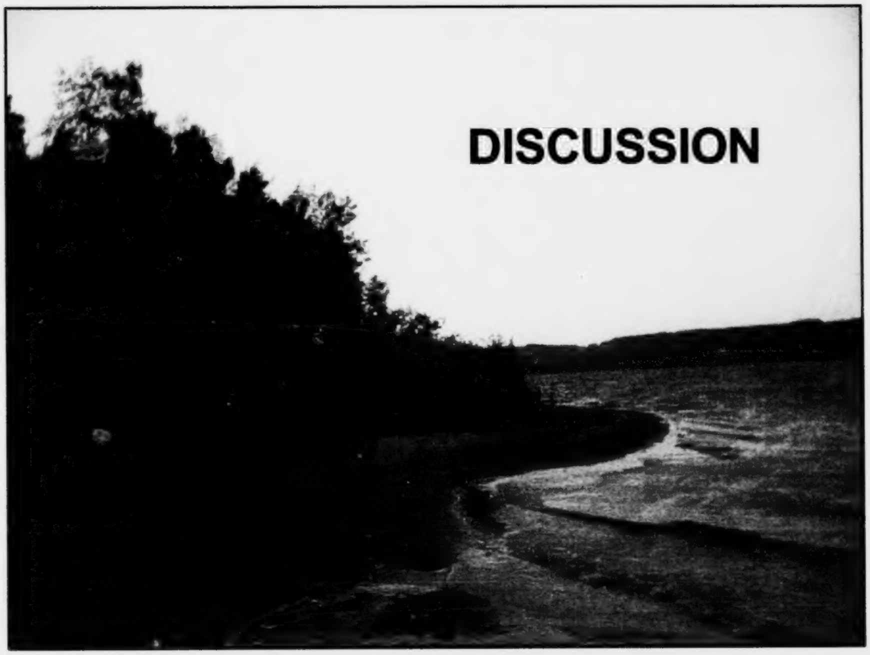
Canada

PUBLIC INPUT

- Public feedback will help shape the Project
- What are your concerns / comments about:
  - reservoir operations (e.g., higher water levels)
  - the environment (e.g., fish habitat);
  - the economy (e.g., local tourism);
  - farming (downstream impacts, irrigation);
  - industrial water use (e.g., food processing);
  - municipal water use (e.g., downstream cities);
  - recreation (e.g., cottages, beaches, and boat launches);
  - other.

Manitoba

Canada



DISCUSSION

APPENDIX D

Examples of Completed Standardized Issue-Recording Form

TetrES
NOV 20 2003

Shellmouth Dam Consolidation Agreement

Meeting at PFRA Dauphin on Nov 19, 2003

Name	Agency	Address	Telephone
Darryl Chudobiak	DFO Dauphin		

p:shellmouth/environmental/meetingattendance

Tetres

Page

Public comments for meeting with DFO Dauphin

Date: Nov 19/03 Time: 3:00 pm

Recorded by: Kettler

Topic: Environment Economic Social Cultural Other

Question / Concern / Issue

- DFO likely to be RA, along with PFRA.
- How will withdrawal regimes impact D/S ?
- How have " " impacted "

Asked by: Chudobiak

Response:

Answered by:

Topic: Environment Economic Social Cultural Other

Question / Concern / Issue

- On IFN committee utilize it to full extent
- Adding additional storage results in HADD.
- An operational strategy will need to be formalized.
- Need to examine methyl mercury (these investigations are ongoing).

Asked by:

Response:

Answered by:

Page

Public comments for meeting with DFO Dauphin

Date: Nov 19/03 Time: 3:00pm

Recorded by: Kettler

Topic:	**Environment** **Economic** **Social** **Cultural** **Other**
Question / Concern / Issue	- effects on riparian area now submerged - effects on fish habitat that is more greatly submerged - significant walleye population, what spawning grounds could be impacted? what feeding areas could be impacted?
Asked by:	
Response:	
Answered by:	

Topic:	**Environment** **Economic** **Social** **Cultural** **Other**
Question / Concern / Issue	- most productive food areas where light penetrates water. If lost could be a concern. - DFO Dr. Bill Franzin would be good contact on this type of habitat for TetrES to contact in Wpg. Dr. Franzin is on IFN committee.
Asked by:	
Response:	
Answered by:	

Page

Public comments for meeting with DFO Dauphin
Date: Nov 19/03 Time: 3:00 pm
Recorded by: Kettler

Topic: Environment Economic Social Cultural Other

Question / Concern / Issue

- What happens to biota (fish) pop'ns in short & long term due to changes in operating regime?
- Where do fish spawn? In adjacent streams? ~~If not in reservoir then~~

Asked by:

Response:

Answered by:

Topic: Environment Economic Social Cultural Other

Question / Concern / Issue

- Contact Kelly Cochrane wrt Navigable Waters permitting in Wpg.
- PLP to Wpg on Assiniboine in Wpg DFO District. Contact ~~Rich Janusz~~ in DFO Wpg to come to mtg on Dec 10. ← Kathy Fisher

Asked by:

Response:

Answered by:

TetrES
NOV 20 2003

Shellmouth Dam Consolidation Agreement

Meeting at PFRA Dauphin on Nov 19, 2003

Name	Agency	Address	Telephone
Chuck Lund	MTGS Dauphin	P.O. Box 690, Dauphin	622-2262
Jerry Zihrul	" "	R7N 3B3	622-2257

p:shellmouth/environmental/meetingattendance

Tetres

Page

Public comments for meeting with MTGS Dauphin

Date: Nov 19/03 Time: 1:00 pm

Recorded by: Kettler

Topic: Environment Economic Social Cultural Other

Question / Concern / Issue

- Preferable to maintain old PTH 83 bridge in park.
  RM of Shellmouth-Boulton may own this structure, probably not owned by MB Parks. Plans for this bridge likely in Wpg as Hwy #31 (changed to PTH 83).
- on cropping D/S of dam consider looking at air photos or landsat record to see if pasture was cropped in late 60's etc.
  Check with Natural Resources for air photos.

Asked by: Chuck Lund

Response:

Answered by:

Topic: Environment Economic Social Cultural Other

Question / Concern / Issue

- contact Ismail Elkholy Bridge Branch and invite to a meeting in scoping (eg) Sioux Valley issue.
- on Sioux Valley / MTGS issue Don McKibbon and Herb Mahood in Brandon, 726-6300. Invite to Brandon Mtg-
- Access road to low level outlet for observation of piezometers, toe of dam, low level outlet performance.
- Invite Bob McKay MTGS Portage to Portage Mtg.

Asked by:

Response:

Answered by:

Page

Public comments for meeting with MTGS Dauphin

Date: Nov 19/03 Time: 1:00 pm

Recorded by: Kattler

Topic: **Environment** **Economic** **Social** **Cultural** **Other**

Question / Concern / Issue

- Permit from MTGS would be required for construction activities within a "Controlled Area".
- Dwgs provided AAK pass on to KGS. JS retain one copy.
- Could check for low lying municipal roads.
- Would backwater on Shell R. impact PTH 83?
- Could contact local economic development officers, planning districts.

Asked by: Chuck Lund

Response:

Answered by:

Topic: **Environment** **Economic** **Social** **Cultural** **Other**

Question / Concern / Issue

- Boat launch at Old Hwy #5 embankment
- Additional cottage lots are being contemplated
- Slide area S. of PTH 83 bridge on Shell R. KGS worked on this portion of PTH 83
- There was a slide problem on old 83 near Ski Asessippi
- MTGS has profile of old PTH 83 road in Wpg Dan Miller 945-3661

Asked by:

Response:

Answered by:

Page

Public comments for meeting with MTGS Dauphin

Date: Nov 19/03 Time: 1:00pm

Recorded by:

Topic: Environment Economic Social Cultural Other

Question / Concern / Issue

- There used to be a hydrocarbon refinery in Kamsack. Oil pumped in this area? Mineral rights issues? This may be important if landowners retain mineral rights.
- MTGS owns 40ft wide strip of road and bridge across Shellmouth Dam. See attached documentation.

Asked by: Chuck Lund

Response:

Answered by:

Topic: Environment Economic Social Cultural Other

Question / Concern / Issue

- Did MB Crown Lands sell some of original purchased land back to landowners in early 90's. At higher elevations.
- Check clearances of bridges eg PTH5 for Navigable Waters. Talk to Tony Capizzi, MTGS Wpg.

Asked by: Jerry Zihrul

Response:

Answered by:

Page

Public comments for meeting with MTGS Dauphin

Date: Nov 19/03 Time: 1:00 pm

Recorded by: Kettler

Topic:	**Environment**	**Economic**	**Social**	**Cultural**	**Other**

Question / Concern / Issue

- Aerial recon. photos of PTH 83 and PR482 slides and other features were flown in 1999 or 2000.
- Local municipal emergency services may be a good contact
- Manitoba Wildlife Federation would be a good contact.

Asked by: Chuck Lund

Response:

Answered by:

Topic:	**Environment**	**Economic**	**Social**	**Cultural**	**Other**

Question / Concern / Issue

- Ray Van Cauwenberghe 945-1934 Wpg wrt any ground data on PR482 or PTH 83 slide areas.
- Road closure maximum 90 days under DM's signing authority. For longer road closure an Order-in - Council is required.

Asked by:

Response:

Answered by:

Page

Public comments for meeting with MTGS Dauphin

Date: Nov 19/03 Time: 1:00 pm

Recorded by: Kettler

Topic: **Environment** **Economic** **Social** **Cultural** **Other**

Question / Concern / Issue

- Jerry Holmes Provincial Toponymist may have useful topographic data upstream
- Backwater effects on PR482 Cupar Creek may cause failure. On SK side of reservoir. Unstable slope.
- Bridge at Shellmouth was constructed after the dam. Should be a soil log or two available.

Asked by: Chuck Lund

Response:

Answered by:

Topic: **Environment** **Economic** **Social** **Cultural** **Other**

Question / Concern / Issue

- Additional soils analysis (penetration tests, etc) info available on PTH 83 slide since KGS worked on this project.
- soils studies and info available for PTH16 bridge near Russell.
- Agronomic soils data / logs were done pre-war for D/S.

Asked by:

Response:

Answered by:

TetrES
NOV 20 2003

Shellmouth Dam Consolidation Agreement

Meeting at Dauphin Prov. Bldg. on Nov [redacted] 19, 2003

Name	Agency	Address	Telephone
Bruce Wright	MB. Cons.	1129 Queens Ave Bdn.	726-6299
DAN LAYCHUK	"	27-2nd AVE SW DAUPHIN	622-2213
Bruce Mitchell	✓	Box 640 Swan River R0L1Z0	734-3429
DON JACOBS	"	27-2ND AVE. SW DAUPHIN.	622-2209.
JACK DEAN	✓	1129 QUEENS AVE. BDN	726-6304
ROD MCFADYEN	✓	27-2nd Ave S.W. Dphn	622-2104
Bill Tichon	MB CONS/ENV.	27-2nd AVE SW Dauphin	622-2126
PERRY STONEHOUSE	WATER STEWARDSHIP?	1129 QUEENS AVE BDN	726-6764
Lorne Mesander	Man Con-Lands Br.	27- 2nd Ave, Dphn	622-2103
Brian Yake	? Water Stewardship	Box 640 Swan River R0L1Z0	734 3429
PETE HILDEBRAND	MB CONS	Box 640 SWAN RIVER	734-3429
Ken Kansas	Fisheries	Roblin office include for correspondence	

Tetres

Page

Public comments for meeting with IRMT

Date: Nov 19/03 Time: 10:00 am

Recorded by: Kettler

Topic: **Environment** **Economic** **Social** **Cultural** **Other**

Question / Concern / Issue

No written comments will be provided. Consultant should interview respective agency experts. Telephone calls during this phase to key players such as McFadyen should take place during env scoping.

Asked by:

Response:

Answered by:

Topic: **Environment** **Economic** **Social** **Cultural** **Other**

Question / Concern / Issue

Cannot provide explicit advice until know what project is.
General comments:
winter kill criteria: - reservoir levels (deeper better)
- inflow (more better)

Asked by:

Response:

Answered by:

Page

Public comments for meeting with IRMT

Date: Nov 19/03 Time: 10:00am

Recorded by: Kettler

Topic: **Environment** **Economic** **Social** **Cultural** **Other**

Question / Concern / Issue

Benefit to fishery wrt winterkill if reservoir deeper.

Asked by:

Response:

Answered by:

Topic: **Environment** **Economic** **Social** **Cultural** **Other**

Question / Concern / Issue

- Consider including control of grazing adjacent to reservoir to improve water quality!
- Was this considered for Kamsack leases?

Asked by:

Response:

Answered by:

Page

Public comments for meeting with IRUT

Date: Nov 19/03 Time: 10:00 am

Recorded by: Kettler

Topic: Environment Economic Social Cultural Other

Question / Concern / Issue

- Impact due to deeper water level on existing and proposed human waste pumpout tanks
- There are also some septic fields

Asked by:

Response:

Answered by:

Topic: Environment Economic Social Cultural Other

Question / Concern / Issue

- Provide the satellite imagery/topog to Parks and others that can provide advice based on this info.

Asked by:

Response:

Answered by:

Page

Public comments for meeting with IRMT

Date: Nov 19/03 Time: 10:00 am

Recorded by: Kettler

Topic:	**Environment**	**Economic**	**Social**	**Cultural**	**Other**

Question / Concern / Issue

- Put together an inventory of land use permits issued for the reservoir.

Asked by:

Response:

Answered by:

Topic:	**Environment**	**Economic**	**Social**	**Cultural**	**Other**

Question / Concern / Issue

- Ensure that the issue of retention or decommissioning of the old Hwy 93 bridge are dealt with by adding MTGS to evaluate utility of bridge. Monitor useage by traffic counts? Replace? Decommission? Parks owns.

Asked by: McFadyen

Response:

Answered by:

Page

Public comments for meeting with IRMT

Date: Nov 19/03 Time: 10:00 am

Recorded by: Kettler

Topic: **Environment** **Economic** **Social** **Cultural** **Other**

Question / Concern / Issue

Consider all unauthorized access points (eg road down to low level outfall) with MTGS as to traffic safety. Also pulloff at viewpoint, access to prisoner's point. No speed reduction on dam.

Asked by: McFadyen

Response:

Answered by:

Topic: **Environment** **Economic** **Social** **Cultural** **Other**

Question / Concern / Issue

Long term monitoring useful to establish..

- eg sediment monitoring
- eg mercury levels

... benefits or impacts

- eg monitor nutrient reduction if build in riparian zones, limit access.

Asked by:

Response:

Answered by:

Page

Public comments for meeting with FRMT

Date: Nov 19/03 Time: 10:00 am

Recorded by: Kettler.

Topic: Environment Economic Social Cultural Other

Question / Concern / Issue

- Send out a project newsletter bi-annually to ensure key players are aware of progress.
- "McKiney Cottages" is "Mitchell's" Subdivision.
- Missed Keatings development south of Mitchell's on east side of reservoir.

Asked by:

Response:

Answered by:

Topic: Environment Economic Social Cultural Other

Question / Concern / Issue

- Seasonal lots at Pyott's point have slope stability issues (shoreline erosion). This may all be on crown land.

* - If fishery improved this project may receive a very local positive reaction. Some of biggest issues relate to fishing and access therefor. *

Asked by:

Response:

Answered by:

Page

Public comments for meeting with Angela Bidinosti INAC

Date: Jan 28/04 Time: 2:00pm - 3:00pm

Recorded by: A.V. Kettler

Topic:	**Environment**	**Economic**	**Social**	**Cultural**	**Other**
Question / Concern / Issue Provided Angela with project background info to ensure INAC is aware of project activities					
Asked by:					
Response:					
Answered by:					

Topic:	**Environment**	**Economic**	**Social**	**Cultural**	**Other**
Question / Concern / Issue					
Asked by:					
Response:					
Answered by:					

APPENDIX E

Shellmouth Dam
Environmental Scoping Meetings
First Nations Draft Report

Shellmouth Dam
Environmental Scoping Meetings

First Nations Draft Report

Prepared For:
Tetr*ES* Consultants Inc.

Privileged and Confidential

Prepared By:

CENTRE FOR INDIGENOUS ENVIRONMENTAL RESOURCES

March, 2004

CIER, the Centre for Indigenous Environmental Resources, is a national Aboriginal-owned environmental non-profit organization. We offer research & consulting and education & training services to Aboriginal and non-Aboriginal communities, governments and private companies in four interrelated topic areas: forestry, climate change, water, and sustainability.

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1.0 Introduction

1.1 History of Project

The Prairie Farm Rehabilitation Administration of Agriculture of Agriculture and Agri-Food Canada and Manitoba Water Stewardship plan to address future water demands on the Assiniboine River by increasing the storage capacity of the Shellmouth dam reservoir. Modifications to the current structure or operations of the Shellmouth dam would improve flood control and increase water supply. CIER was sub-contracted by TetrES Consultants to facilitate meetings between the Federal and Provincial Government Steering committee and aboriginal participants to ascertain environmental issues and their concerns before an environmental assessment is conducted or final project decisions are made.

1.2 Purpose of Meetings

The purposes of the meetings were to discuss proposed changes to the works and operations of Shellmouth Dam. CIER identified 13 communities along or near the Assiniboine River based on geographical location, and past working experience with many of the identified First Nations. These First Nations were invited to provide their input in designing a comprehensive environmental assessment.

1.3 Objectives of Meetings

The objectives for the meetings were as follows:

1. To present the proposed project to the First Nations
2. To gather all comments and concerns voiced by those present at the meetings
3. To compile the gathered information in a clear, concise manner that will assist the Steering committee in providing recommendations on the final project design.

1.4 Scope of Work

The scope of work consisted of the following:

1. To identify and contact First Nations that may have an interest in the Shellmouth Dam, Assiniboine River and the proposed modifications to the dam.
2. To invite the identified First Nations to one of four First Nation Environmental Scoping Meetings.
3. To draft and distribute a Steering Committee approved information page to interested First Nations.
4. To draft and mail a Steering Committee approved letter of invitation to interested First Nations.
5. To facilitate the First Nation Environmental Scoping Meetings between the First Nations and the PFRA/Water Stewardship Steering Committee
6. To record all issues/comments/questions and concerns raised by participants at the First Nation Environmental Scoping Meetings.
7. To advise the Steering Committee on appropriate protocols necessary when working with First Nations.
8. To provide the Steering Committee a written report that outlines the results of the First Nation Environmental Scoping Meetings.

2.0 Methods

2.1 Communities Identified

CIER identified 10 First Nation communities in Manitoba and 3 First Nations in Saskatchewan that may be affected by any potential changes to the Shellmouth Dam or Assiniboine River water levels. The First Nations identified are outlined in the following table.

Manitoba First Nations	**Contact**
Tootinaowaziibeeng First Nation	Chief Barry McKay
Gambler's First Nation	Chief Patrick Tanner
Waywayseecappo First Nation	Chief Murray Clearsky, Councillor Mel Wabash
Birdtail Sioux Dakota Nation	Councillor Yvonne Bearbull, Health
Sioux Valley Dakota Nation	Chief Katherine Whitecloud, Councillor Ken McKay
Canupawakpa Dakota Nation	Councillor Marlene Demas
Long Plains First Nation	Chief Dennis Meeches
Dakota Plains First Nation	Chief Orville Smoke, Gwen LaFreniere, CEO
Swan Lake First Nation	Chief Larry Soldier, Bob Green, Economic Development
Dakota Tipi First Nation	Chief Cornell Pashe
Saskatchewan First Nations	**Contact**
Cote First Nation	Chief Aubrey Whitehawk
Key First Nation	Chief Isabelle O'Soup
Keeseekoose First Nation	Chief Quewezance, Councillor Gerald Keshane

2.2 Communities Contacted

CIER contacted all 13 communities by telephone. CIER spoke to a community member in eleven of the thirteen communities. CIER explained the project and asked the contact if they needed more information or confirmed their participation in one of the four scheduled meetings that were to occur along the Assiniboine River. In order to assist the First Nation and CIER in determining whether or not it would be in the community's interest to attend one of the four scheduled meetings, CIER drafted and used a question matrix during the initial phone call. A copy of the Matrix is provided at the end of this report in Appendix G.

2.3 Information Packages and Invitation letters

Prior to distribution by CIER, the First Nation information page and invitation letter were approved by the Steering Committee. The information page was then sent by email or fax to each of the communities. An official letter of invitation followed this document to each of the First Nations. All information and letters were sent to the attention of a specific person in each community. People identified in each community included Chiefs, Councillors and CEO's. In the case of not being able to speak to someone directly, all information was faxed and mailed attention to the chief of the Reserve. Copies of the information page and invitation letter are attached to the end of this report in appendices E and F.

2.4 First Nation meetings

It was decided to host four meetings in four communities that were geographically central to interested First Nations. Each community decided whom they would send and was responsible for their own transportation. The four communities, venues and dates for the First Nation meetings were as follows:

Community	Venue	Date
Kamsack, SK	Woodlander Inn 509 Railway Street	Monday, January 12, 2004
Russell, MB	Russell Inn Highway #16	Tuesday, January 13, 2004
Virden, MB	Jay's Inn and Suites Trans Canada Hwy #1	Wednesday, January 14, 2004
Portage La Prairie, MB	Canad Inns 2401 Saskatchewan Ave. W	Thursday, January 15, 2004

3.0 Results

3.1 Communities Involved

Eleven of the 13 communities accepted the invitation to attend one of the four information-sharing meetings. All communities received telephone calls, emails and faxed copies of the one-page information sheet and written letters of invitation to one or all FN meetings. Tootinaowaziibeeng First Nation and Swan Lake First Nation did not respond to any of the above-mentioned actions taken by CIER to initiate a meeting.

Of the eleven First Nations that confirmed attendance, six were present (Key First Nation, Cote First Nation, Gambler's First Nation, Birdtail Sioux Dakota Nation, Sioux Valley Dakota Nation and Long Plains First Nation) at one of the four meetings. The remaining five communities were unable to attend for various reasons such as: a tragedy in the community; conflicting meeting commitments (meeting the new INAC minister) or no explanation was offered. It was stated during the Russell Meeting by one of the Elders present that all communities were in contact with each other and that all information was being shared whether the communities were present or not. It was also stated by the same Elder that each of the communities present were acting the liaison between the steering committee and all of the contacted First Nations and that all information would be relayed up and down the Assiniboine River.

3.2. Issues Raised

Summary of issues raised:

CIER recorded all questions, comments and concerns and assigned them an "issue name" It is important to note that it was not always possible to name a comment or concern to one heading as many of the issues are connected. The issues identified by CIER were related to: agriculture, communication, flooding, cultural, treaty rights and obligations, water quality, water quantity, environmental, fishing, wildlife, economic, alternatives and general.

Agricultural/Ecomonic

First Nations upstream and downstream of the Shellmouth Dam have interest on the impacts on their agricultural practices such as cereal farming, haying, and watering for animal herds. There were concerns that there may not be enough water for all the irrigation needs of all users. There was concern that the poor quality may have a negative impact on animals that are watered with untreated water from the Assiniboine. There were also concerns that the potential project may cause a loss of agricultural lands and reserve land.

Communication

It was commented that First Nations were not consulted when the initial dam was erected and that no communication has occurred related to the operation of the dam. It was strongly recommended that a communication strategy be developed and implemented to keep First Nations informed of the operations and seasonal events that may have a negative impact on the community. In particular, Sioux Valley noted that they received no notice of impending flood of 1995 by the operators of the Shellmouth dam and that the community suffered property damage.

Flooding

As noted above, flood control is very important for the safety and economic well-being of First Nations along the Assiniboine River.

Cultural

Many traditional ceremonies occur along the river and there would be great concern to the communities if they lost the land to continue these ceremonies. It was also noted that many animals, plants and medicines that were traditionally harvested along the river have been damage by the current dam operations and that any more changes to the water levels may be too much for the environment to recover from these stresses. Because of the current dam, communities have lost one of their traditional travel routes used for trade and interaction with upstream and downstream First Nations.

Treaty Rights

Section 35 consultations will have to be conducted if it has been determined that any treaty rights are infringed upon by the actions of others. Based on these preliminary environmental scoping meetings and the comments gathered to date, it is very likely that Section 35 consultations will need to be conducted.

Environmental/Water quality

Comments revolved around poor water quality now, some attribute this to the dam and concerns that modifications to the dam may further decrease the water quality. People are afraid of swimming in the river and wary of eating fish and plants/medicines from the river because of the poor water quality and associated contamination that may come from the dam, nutrient loading from agricultural practices and other avenues.

Water Quantity

Many saw the benefit of improved water supply and flood control and were aware of competing demands for water. It was made clear that First Nation water needs must also be met whether it is for economic, drinking water, hunting, fishing, social or cultural purposes. Reference was made to a phrase found in treaties related to the continuous flow of water-"the treaties are in effect as long as the sun shines, the grass grows and the water flows" (paraphrased).

Wildlife, Hunting, Trapping and Fishing

Many of the First Nations still hunt along the river and are concerned about a loss in habitat for their game. It has been noted that the trapping industry along the Assiniboine River has collapsed because the fur-bearing animals are no longer there. A Loss of habitat, loss of food and extreme fluctuation of River levels were identified by participants as main reasons for the disappearance of animals such as muskrat and beaver.

A complete list of all issues, comments and concerns is provided at the end of this report in Appendices A, B, C & D. A summary list of all concerns can be found in Appendix H.

3.3 Responses to Issues

It was stated to all participants by the Steering Committee that only issues that fall within the scope of the project would be investigated during an EA process. It was also stated First Nations' issues or concerns that fall outside the scope of the project would be noted.

4.0 Conclusions

4.1 Meetings

All participants present at each of the four meetings expressed their satisfaction with the steps taken up to that point in the project. Specifically, the First Nations were pleased to be involved in the project at a stage early enough that their potential involvement could have some influence on the future EA process.

The Steering Committee and CIER learned by the second environmental scoping meeting that it is culturally appropriate and very important to provide a lunch for the invited guests. It was stated by the Elders of Gambler's First Nation that if and when the project team were invited to the communities for the next round of meetings that the team would be fed out of respect for the visitors. The project team ensured from that point forward to always provide a lunch to the participants. This practice was met with a very positive response from the rest of the participants at the following meetings.

All the First Nations participating in the Environmental Scoping Study have a long standing connection to the Assiniboine River and that any changes to the river will affect them in some way. The concerns and issues raised to date by the First Nations all relate to impacts and/or potential impacts on Aboriginal and Treaty Rights. Any changes to the current environmental/economic/social well-being must be addressed, avoided, mitigated or remediated. All communities brought up the topic of treaty rights; some directly while others alluded to the treaty rights of the First Nations and the fact that any actions taken by anyone that impacts the treaty rights will have to conduct Section 35 Consultations.

The First Nation environmental scoping meetings were very successful. Many of the issues of the potentially impacted communities were raised in these initial meetings. It was also significant for the project team to be invited to four of the communities for the environmental assessments. Key First Nation, Gambler's First Nation, Sioux Valley Dakota Nation and Long Plains First Nation offered to host the remainder of the communities. It was stated to the project team by more than one participant that because of the positive relationship developed during these initial meetings, many more people would attend the next round of meetings.

Providing information such as this report and other information related to the project and the potentially impacted First Nations will continue foster the positive work done to date.

5.0 Recommendations

5.1 Future considerations

It is recommended the Steering Committee continue its current practice of openness, transparency and proactive approach in addressing the environmental/social/ economic/treaty rights concerning the Assiniboine River and the proposed changes to the Shellmouth dam. Clearly, the Committee's approach to the project is one that will provide it (the committee) with as much information as possible and allow the committee the opportunity to provide the best possible recommendations for future steps in the project, namely future environmental assessments.

All communities identified communication as a very important element to any future work related to the Assiniboine River and Shellmouth dam. Communication strategies outlined by the Steering committee will need to be implemented in order to maintain and develop the level of trust and respect it has attained in the preliminary meetings.

APPENDIX A - January 12, 2004 *3:00 pm* Kamsack, SK. Meeting Summary Notes

First Nation Participants:
Bill Braler, Lands Manager, Cote First Nation
Isabel O'Soup, Chief, Key First Nation

COMMENT: General
Regarding the compensation agreement, are you referring to land that's right near the river? How far off the river are farmers claiming damage?

RESPONSE:
Visually demonstrated.

COMMENT: Economic
The province of Manitoba or PFRA purchased the land, who will own it?

RESPONSE: General
The Government of Canada will own the land.

COMMENT: General
Do you know how much acreage is in the agreement?

RESPONSE:
Not finalized but it's 3230 acres right now.

COMMENT: General
And the land in the agreement is all water logged and unusable?

RESPONSE:
Leasing agreements indicate that it may be, studies will determine this.

COMMENT: General
Where does the water logged condition area stop? Where does the dry land begin?

RESPONSE:
Shows bridge at highway

COMMENT: General
What will the land purchased back be used for?

RESPONSE:
It will be leased back.

COMMENT: Environmental
Is it the dam or natural causes that cause various levels of water logging?

RESPONSE:
Both, but it is the dam impact that is being compensated for.

COMMENT: Environmental

Was the dam responsible for 1995 flooding.

RESPONSE:
Not the flood, but seeding was made difficult by the dam.

COMMENT: Treaty
Assiniboine River is one of the boundaries of our reserve. If water level changes that could change our boundaries.

COMMENT: General
If the dam was built in 1970, what is the capacity, do you want to make it bigger?

RESPONSE:
That's the purpose of the study phase, we haven't made any recommendations.

COMMENT:
Say you raise the water 6 feet at the dam, how far north will the water-logged area extend. We are concerned back flooding will go further up the river.

RESPONSE:
We don't know yet.

COMMENT: Agriculture
In the river flats, where flooding occurs now, willows are taking over and hay is dying.

COMMENT: Water Quality
There is a groundwater effect from flooding, not just surface water.

COMMENT: Cultural
Key First Nation has permanent sites for sweats by the river, these will be affected.

COMMENT: Agriculture
If the river increases in size, we will lose pasture land.

COMMENT: Communication
How will information from these studies be disseminated?

RESPONSE:
By a website.

COMMENT: Vegetation
All flats of land along the river are 'bogged out', maple sugar trees are dying as a result of this.

COMMENT: Economic
Can we have a breakdown of the 8 million in compensation?

RESPONSE:
Breakdown was detailed.

COMMENT: Communication

How many First nations are affected downstream? Is Dakota Tipi one of them? How many other bands are you talking to during this phase?

RESPONSE:
We've identified 10. We're also trying to determine if there are more with this study. Map was shown to participants.

COMMENT: General
Why don't you know those engineering possibilities regarding the gates option, even though you built the dam?

RESPONSE:
Standards have changed since original design and knowledge has increased.

COMMENT: Dam Safety
Does the dam safety analysis include the possibility of the dam failing?

RESPONSE:
Yes, that's what an emergency preparedness plan is for.

COMMENT: General
Were there affect studies done before the dam was built?

RESPONSE:
Yes, for example on beaching.

COMMENT: General
Are there any general upstream studies I can read regarding our First Nation or those further north?

RESPONSE:
Yes, we can provide you a list.

COMMENT: General
When are you planning construction? What's the time frame?

RESPONSE:
Outlined in presentation.

COMMENT: Economic
Are you selling the water, for example to farmers? It will be scarce in a few years time.

RESPONSE:
We only charge for industrial use, not irrigation but this could change.

COMMENT: General
Who sets the limits for water use if it's not being sold?

RESPONSE:
Provincial licensing will look at these issues.

COMMENT: General
When water starts going through the spillway, can you control it at this point?

RESPONSE:
Yes it's for floods.

COMMENT: General
If everything goes to plan, can you explain in simple terms where you'll build up the dam?

RESPONSE:
Uses map to show gates.

COMMENT: General
Will the embankment hold the water if the gates don't?

RESPONSE:
We don't know yet, we'll need further studies.

COMMENT: General
Have you ever used the spillway?

RESPONSE:
Yes, for example in 1995.

COMMENT: Dam Safety
Have you ever considered security measures, similar to a dam in British Columbia where security is high because it provides electricity to the US? Does the Shellmouth dam provide electricity?

RESPONSE:
No, this dam is strictly flood control. Security isn't expected to be an issue.

COMMENT:
If you control the downstream with these gates, won't it be the upstream communities that will be truly affected?

RESPONSE:
Noted.

COMMENT: Communication
Are you having these meetings with other groups besides First Nations? I'd like to hear other general issues, as an individual.

RESPONSE:
We will notify you of other meetings.

COMMENT: Communication
How soon can I get a copy of the agreement?

RESPONSE:
A copy was given.

COMMENT: Communication
So others were invited to these meetings, not just Chiefs.

RESPONSE:
Yes, perhaps that wasn't made clear.

COMMENT: Treaty
Our major concern is changing water levels which will change our land boundary. It will take land away from our band. Is there a map of the river before the dam was built and then after?

COMMENT: Wildlife
Wildlife management is a concern. Wildlife migration in the valley will be effected.

COMMENT: Cultural
We have the oldest church in Saskatchewan on our reserve approximately one mile from the river. We intend to obtain heritage status for it. Burial grounds are there as well. Harry Miller, Minister, wrote a book in the 1980s referencing this site.

RESPONSE:
Are there any records we can access to be aware of these sites?

COMMENT: Communication
There is data about the weir in Kamsack including its elevation, backwater, etc. This would be useful to the study.

COMMENT: Communication
We'd like the next on-reserve meeting to be held as a group, for both of our First Nations.

APPENDIX B - January 13, 2004 *10:00 am* Russell, MB Meeting Summary Notes

First Nation Participants:
Sam Musqua, Elder, Gambler First nation
Christine Andy, Elder, Gambler First Nation
Sharon Tanner, Elder, Gambler First Nation
Albert Tanner, Elder, Gambler First Nation

COMMENT: Treaty
Gambler First Nation people were promised that land to hunt and fish in their treaty. Will treaty rights be affected by changing the river? Will altering the river create a dependance on the government when we can't fish anymore.

COMMENT: Wildlife
Will the wildlife go away.

COMMENT: Cultural
The creator owns the river. Seven generations will be affected when you change the river. If you take the river away, will only a scar be left?

COMMENT: Economic/Treaty
The value of the land will be affected.

COMMENT: Treaty
There are supposed to negotiations if the river that goes through our land is affected. You need our permission if you are going through our territory.

COMMENT: Fishing
Our fish supply has been depleted by the dam already, there are only suckers left.

COMMENT: Alternative
The river should stay the way the creator made it, the creator made it for a reason.

COMMENT: Economic
We know altering the river will affect us. Who will compensate us for this?

COMMENT: Alternative
You already have the farmers complaining, why change the dam further?

COMMENT: Communication
The dam has done harm to us in the past, why would our concerns be heard now?

COMMENT: Cultural
We must look out for the next seven generations. We need to know that we will be listened to.

COMMENT: General
Why don't you give us the money to study it ourselves. We have stewardship of the land and the Elders know the land.

COMMENT: General
What do you consider 'environmental'?

RESPONSE:
We consider environmental to mean everything that people interact with.

COMMENT: Cultural
We believe that all things have a spirit and you are proposing to alter that spirit. The river is sacred to us. We use the river for our ceremonies, we get our sweat rocks from it, we get our medicines from it we use the water for our ceremony.

COMMENT: General
We see this as a project that is already flawed.

COMMENT: Communication
We would rather do business in our own community.

COMMENT: Communication
We don't understand this presentation, because we learn by doing.

COMMENT: Water Quality/Cultural
Water quality is an issue for us. Our traditional land use has been affected by the dam.

COMMENT:
Emergency preparedness is important.

COMMENT: Cultural/Communication
When you meet with us in friendship, you should share food and tea with us.

COMMENT: Cultural
The river has a purpose it gives us life. Even water has a spirit, you have to treat it with respect.

COMMENT: Water Quality
We can't drink or wash in the water from the river, but our wildlife does. Maybe this is because of the dams, or the mines. We want the water tested to see what's in it.

COMMENT: Water Quality
There's another river under the water, our old people talk about it. That's the water that goes into our community, that's why we can't drink the water, it can't be cleaned.

COMMENT: Water Quality
When will the water be tested, during the environmental assessment?

COMMENT: Communication
When you get your list of concerns, what are you going to do with it?

COMMENT: General
We want to be involved in the next steps.

COMMENT: Water Quality/Alternatives
Look at the water quality now, before you move ahead. Look at the problems that already exist. There are natural filters upstream, and there is something that has stopped that natural cycle.

COMMENT: Water Quality
Our water is our concern. We don't just want to talk about the effects it may have, we want to talk about the effects is already has.

COMMENT: Water Quality
Our band has to buy drinking water, yet we have a river running through our community.

COMMENT: Water Quality
We want to know whether there is mercury or fertilizer in our water and how that affects our children.

COMMENT: General
There have been no benefits to us by the dam. How will changing the dam benefit us?

COMMENT: Water Quality
We get rashes from using tap water, or in showers. We get rashes from being in the middle of the river.

COMMENT: Wildlife
The last trapper left 3 years ago. Because the water level went down so much, the beaver have moved on.

COMMENT: Water Quality
There are snails in the water now.

APPENDIX C - January 14, 2004 ***10:00 am*** Virden, MB Meeting Summary Notes

First Nation Participants
Steven Hanska, Community Member, Birdtail Sioux
Mike Hanska, Community Member, Birdtail Sioux
Ronald Hall, Project Manager, Sioux Valley Dakota Nation
Verne La Forte, Director of Operations, Sioux Valley Dakota Nation

COMMENT: Economic
Do you have an indication from ethanol plants as to their interest in this project. One of their requirements is their access to natural gas and natural water.

RESPONSE:
One by Harrowby has expressed interest. We also have to consider location of water as well as demand.

COMMENT: Dam Safety
Will the dam safety analysis be shared will all the communities along the river?

RESPONSE:
Yes, there will be workshops on emergency preparedness.

COMMENT: Water Quantity
In 1995, what was the cause of the sudden increase of water?

RESPONSE:
Fast melting, late snowstorms in the basins all the tributaries came in.

COMMENT: Water Quantity
Water was 3 times the capacity in 1995?

RESPONSE:
Yes. The dam has a 380,000 acre feet capacity, in 1995 it was over 1 million. The gates would add 100,000 acre feet capacity.

COMMENT: Water Quantity
Was 1995 a 1 in 100 year flood or a 1 in 1000 year flood?

RESPONSE:
1 in 100.

COMMENT: Water Quantity
Are your levels low now?

RESPONSE:
Yes. 1399

COMMENT: Communication

During the 1995 we had a communication problem. Communication will be vital in the coming years. Since 1995 we've started getting reports about the dam, we've developed an emergency committee. The information about the dam must be channeled downstream. We should be informed about dam activity the same as all Canadians.

COMMENT: Communication
Are there any other information besides the website?

COMMENT: Communication
Our water treatment plant was in the flood zone in 1995. We were in a state of emergency and had to truck in water. The highways department were ticketing our trucks due to lack of communication. We should be informed ahead of time if there is a flood coming.

COMMENT: Communication
Since 1995, faxes of information have proven very useful.

COMMENT: Communication
Will we be receiving reports of information?

RESPONSE:
Other communities have recommended a report just for First nations.

COMMENT: Communication
Will the environmental assessment include the information gathered from First Nations?

RESPONSE:
Yes, there will be formal public meetings.

COMMENT: Flooding
Sioux Valley is in the valley and the hills. 40% of the reserve base is in the valley. The impact of a flood is very high.

COMMENT: Flooding
During a flood, Highway #1 acts as a dyke.

COMMENT: Flooding
Homes in the valley had to be moved because of flooding.

COMMENT: Flooding/ Water Quality
Our water treatment plant is in the floodway.

COMMENT: Agriculture
Farmlands were impacted by floods, after the clean up they had to be re-seeded.

COMMENT: Agriculture
Soil is impacted, and prime agricultural land. To this day, seepage prevents us from using it after the 1995 flood, the land is spongy.

COMMENT: Communication

We've done tests, we already know there have been environmental impacts. We hope this information will be considered.

COMMENT: Dam Control
We're hearing that others have more control over the dam.

COMMENT: Communication
We are impacted by the dam, but we have not seen communication. If Brandon can get a report of dam activity immediately, we should get one too.

COMMENT: Communication / Flooding
We accept that emergencies happen, there could be seepage again. We need the opportunity to respond.

COMMENT: Contamination
Sioux Valley has done a lot of environmental studies, of 400 homes in our community. There has been contamination of land and water.

COMMENT: Water Quality
What is in the water when it floods? That water comes in to our community, how do we change that impact?

COMMENT: Dam Control
Who controls the dam?

RESPONSE:
MB Fisheries biologists, not sportsmen. We have to supply water to the downstream regardless of fish.

COMMENT: Communication
The story that we get is that the dam is controlled by sports fishermen. That's why communication is important.

RESPONSE:
A result of the scoping study could explain how the dam is controlled.

COMMENT: General
We accept that the dam is there for a reason.

COMMENT: Flooding / Economic
1995 flood caught us off guard. It cost us 2 million dollars. We had to go after the Federal and Provincial governments for help. Farms east and west of the highways were dyked but we weren't. Only the water plant was dyked after 1995. We could put a dyke on the east of the reserve but it costs too much.

RESPONSE:
All our studies reveal we must at least maintain flood control, that is mandatory.

COMMENT: Economic
We have plans to utilize the water, irrigation and a proposed ethanol plant.

COMMENT: Communication
If there are any changes to the dam, we would like to be involved and have input. Our leadership wants to see that.

COMMENT: Economic
If we flood again, is there compensation, for example if our alfalfa fields flood.

RESPONSE:
I don't know if forage crops are covered.

COMMENT: Communication
We would prefer meetings in our own community if the project proceeds. Bringing all the DOTC bands together would be better.

COMMENT: Economic
Funding is needed for cleanup after floods. Fences are knocked down, logs are in the fields, hay is needed. All farmers need this, on and off reserve.

COMMENT: Flooding
The impact of flooding is great in our community. We have to move cattle, we have to find shelter for our people. Shellmouth may be many miles from our community but it affected our community.

COMMENT: General
Sioux Valley has a lot of interest in this dam, it affects 2000 people of our community.

COMMENT: Communication
We're preparing to protect our sewage treatment plant from flood. We want a say in what goes into the Shellmouth Dam.

COMMENT: Cultural / Water Quality
We as Dakota Nations know from living on the river that water is life, it gives life to everything. We can't eat the fish from the river.

COMMENT: Cultural
Our ancestors used the waterways to travel. People traveled to the meeting place on the river. The waterways are very important to our people. It means survival to us, like our plants, our medicines.

COMMENT: Cultural
Modern health care may not be around for long and we may have to go back to our traditional healing ways.

COMMENT: Cultural / Treaty
We are thinking about what's going to happen to our grandchildren. 10 - 20 years from now, our community's land base won't be enough. By 2023, our population projection is twice as many people (4000) in a 6 by 3 mile area. If flooding continues and takes 40% of our land, there won't be enough left.

COMMENT: Communication

If the dam fails, will you tell us?

COMMENT: Communication / Treaty
Self government means all First nations need to be informed on a nation to nation basis.

APPENDIX D - January 15, 2004 ***10:00 am*** Portage La Prairie, MB Meeting Summary Notes

First Nation Participants:
Thomas Myran, Lands Department, Long Plain First Nation
Harley Myran, Long Plain First Nation Trust, Long Plain First Nation
Steve Prince, Community Land, Long Plain First Nation

COMMENT: Economic
Long Plain has irrigation plans to increase land revenue which involves 6000 acres of land irrigated to local farmers over 3 years. This initiative is well into planning stage and involves JR Simplot, INAC and PFRA and Long Plains' Economic Development Corporation. Currently applying for water license and environmental assessments are being done.

COMMENT: General
Will this affect / be affected by the Garrison project? Will the Garrison project be considered? This kind of possible spillage is unnatural.

RESPONSE:
Canada is fighting this diversion. It is not directly related to Shellmouth but may affect it along with the Devil's Lake project.

COMMENT: Cultural
We will be using the water. Our people have always been users of the river, for trapping, transportation. Is there enough water for everyone downstream including us?

COMMENT: Cultural / Water Quality
We will not abuse the water, we want to build our own reservoirs for scarce years. We want to everything we can to preserve the water, to take only what needs to be taken and put it to good use.

COMMENT: Economic /Water Quality
We want to increase land revenues with irrigation and the river needs to be healthy.

COMMENT: Cultural
Not too many of our people fish nowadays.

COMMENT: Economic / Water Quality
Long Plain leases land to local farmers, we don't farm the land ourselves. As land managers we need to take good care of the land.

COMMENT: Cultural
People stopped fishing in the 1960s, but they relied on it for their livelihood before then. They relied on the fish and the berries that grew on the river. They used the wild grapes in their daily diet, cranberries, medicines.

COMMENT: Cultural / Water Quality

Fishing is done with a rod and reel now, it used to be nets across the river. You used to be able to see the bottom of the river, now you can't.

COMMENT: General
Water usage is going to increase from other things besides irrigation, like housing.

COMMENT: General
We have property near Portage la Prairie. Possible uses include a hotel and casino, office space, travel stop, museum, correctional institute. These will all use water resources.

COMMENT: Communication / Treaty
Don't forget that as long as the water flows on the river, we need to be informed. Communication is important to us.

COMMENT:
Outside the reserve freshwater is being provided to farmers through the water services branch.

COMMENT: Water Quality
How will the dam impact underground aquifers that we rely on. This is where we get our water from.

COMMENT: Communication
Have you considered effects on Hutterite people? They are very separate and may even be dealt with the way First Nations have.

COMMENT: Wildlife
Wildlife can be changed by diversions like this. An example is unnaturally competing species of fish.

COMMENT: Communication
Have you considered putting this information on APTN or NCI radio? This would inform people right in the communities, especially shut-ins and elders, it would increase your audience.

COMMENT: Communication / Cultural
Community visits would be beneficial, and broadcasting your recommendations on reserve radio. Long Plain can be a central area for community meetings. Hutterite people can be included, we have a good relationship.

COMMENT: Cultural
We appreciate your prayers and smudge. Most communities respect your way of doing things, as long as you do it.

COMMENT:
Consider the ripple effect of the river. If we're having problems up the river it will come down to you.

COMMENT: Communication

To present to more communities, you should do a 'canned' PowerPoint presentation, with explanations, etc. This way they could watch it at band meetings or at their leisure.

COMMENT: Communication / Cultural
Committee needs to visit the First Nations so the people can show them the issues first hand.

COMMENT: Communication
Committee needs to have meetings on First Nations during environmental assessment so that the community understands the project.

APPENDIX E - One-paged First Nation-Shellmouth Dam Information Sheet

Canada - Manitoba Shellmouth Dam Consolidation Agreement
Entente de consolidation Canada - Manitoba sur le barrage Shellmouth

What is the Canada - Manitoba Shellmouth Dam Consolidation Agreement?

The Government of Canada and the Province of Manitoba plan to address anticipated future water supply concerns along the Assiniboine River by upgrading the Shellmouth Dam to allow for retention of larger volumes of water in Lake of the Prairies.

The proposed Shellmouth Dam upgrading is one of four initiatives under the Canada - Manitoba Shellmouth Dam Consolidation Agreement. The other three initiatives are payments for past damages to upstream farmers, additional upstream land control, and study of downstream impacts due to reservoir operations.

Why are we Contacting First Nations?

The Prairie Farm Rehabilitation Administration (PFRA) of Agriculture and Agri-Food Canada and the Manitoba Conservation water Branch want input from First Nations and the public before the project is defined. The Centre for Indigenous Environmental Resources (CIER) has been hired to facilitate meetings with First Nations who believe they may be affected by proposed upgrades to Shellmouth Dam. These meetings are not formal consultations but a chance for interested First Nations to share potential issues and concerns about this new project.

How Will the Information Discussed in the Meeting be Used?

The issues and concerns that are raised during the meetings will be used by PFRA and Manitoba Conservation to guide the engineering and environmental assessment (EA) processes. When the project is defined and the EA begins, there will be further discussions with First Nations and the public to discuss potential impacts.

Who Can Tell Me More About the Proposed Upgrades to Shellmouth Dam?

Tony Kettler of PFRA Manitoba Region is the Project Manager. Tony can be reached at (204) 983-3627. Mike Pierre of CIER is facilitating meetings with First Nations. Mike can be reached at (204) 956-0660.

Canada

Manitoba

APPENDIX F - Example of First Nation-Shellmouth Dam Invitation Letter

Canada - Manitoba Shellmouth Dam Consolidation Agreement
Entente de consolidation Canada - Manitoba sur le barrage Shellmouth

December 11, 2003

Agriculture and Agri-Food Canada
Prairie Farm Rehabilitation Administration
Manitoba Region
200-303 Main Street
Winnipeg, Manitoba R3C 3G7

Name
Organization
Street Address
City, Province Postal Code
Fax:

Dear XXX,

You are invited to meet with the Agreement Steering Committee to discuss proposed changes to the works and operations of Shellmouth Dam. A series of meetings has been scheduled with groups and individuals who may have an interest in the project to gather input on potential issues related to the proposed upgrade. Please attend the First Nations meeting in Town, Province at Time on January Date, 2004, if you are available. A list of meeting dates, locations and groups is provided below if you are not available to meet at the above suggested place and time.

The Government of Canada and the Province of Manitoba plan to address anticipated future water supply concerns along the Assiniboine River by upgrading the Shellmouth Dam to allow for operation at higher levels of water in Lake of the Prairies. Improvements to the dam would provide increased water supply and flood control benefits.

The proposed Shellmouth Dam upgrading is one of four initiatives under the Canada-Manitoba Shellmouth Dam Consolidation Agreement. The other three initiatives are compensation for past damages to upstream farmers, additional upstream land control, and study of downstream impacts due to reservoir operations. Agreements for past damages to upstream farmers and additional upstream land control have been negotiated. The study on downstream impacts due to reservoir operations is just getting underway.

The Prairie Farm Rehabilitation Administration of Agriculture and Agri-Food Canada and Manitoba Water Stewardship engaged the Centre for Indigenous Environmental Resources (CIER) to facilitate Aboriginal involvement in identifying environment-related issues in advance of project decisions and environmental assessment. CIER will attend each of the meetings to assist the Steering Committee in "scoping" potential issues related to the proposed upgrading.

Preliminary engineering investigations have just begun and final project decisions are not anticipated to be made until late 2004 or early 2005. Broader consultations with Aboriginal peoples would also take place if necessary as the project develops (i.e., in advance of final project decisions being taken).

Please confirm attendance at the suggested or alternate time and location to Michael Pierre of CIER at (204) 956-0660 ext. 226. You may forward this letter to other people who may be interested in attending the meetings. If you are unable to attend any meeting and wish to find out more about the proposed upgrading to the Shellmouth Dam, please call the undersigned at (204) 983-3627. It is important for the Steering Committee to receive your opinion verbally or in writing.

Sincerely,

Anthony J. Kettler
Project Manager
PFRA Manitoba Region

SHELLMOUTH DAM MEETINGS SCHEDULE

DATE & TIME	LOCATION	GROUP
Monday, January 12, 2004 3:00 p.m. to 7:00 p.m.	Woodlander Inn- 509 Railway Street Kamsack, SK	Key, Keeseekoose and Cote First Nations
Tuesday, January 13, 2004 10:00 a.m. to 2:00 p.m.	Russell Inn- Highway #16 Russell, MB	Tootinaowaziibeeng, Waywayseecappo, Gamblers First Nations
Wednesday, January 14, 2004 10:00 a.m. to 2:00 p.m.	Jay's Inn and Suites– Trans Canada Highway No. 1 Virden, MB	Birdtail Sioux, Sioux Valley, Canupawakpa Dakota Nations
Thursday, January 15 10:00 a.m. to 2:00 p.m.	Canad Inn - 2401 Saskatchewan Ave. W Portage la Prairie, MB	Dakota Plains and Dakota Tipi Dakota Nations, Long Plains and Swan Lake First Nations

APPENDIX G - *Matrix Questions to First Nations*

	FN/ Organizations Short List	**Contact**	**Status**	**Reasons for selection- Geography I.R. lands Traditional Lands Outstanding TLE claims?**	**Treaty/ No Treaty**	**Does your community have any outstanding TLE claims near Assiniboine River?**	**Does your community have any interest in the Assiniboine River?**	**Does any part of the river apart of your traditional lands?**	**Do you use lands on or near the River?**	**What do you use them for? Swimming, Fishing, recreational, economic, social, traditional, etc.?**	**Do you use the river for other purposes?**	**Is your community interested in participating in the consultation process?**	**Tentative Scheduling**
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

	FN/ Organizations Short List	Contact	Status	Reasons for selection- Geography I.R. lands Traditional Lands Outstanding TLE claims?	Treaty/ No Treaty	Does your community have any outstanding TLE claims near Assiniboine River?	Does your community have any interest in the Assiniboine River?	Does any part of the river apart of your traditional lands?	Do you use lands on or near the River?	What do you use them for? Swimming, Fishing, recreational, economic, social, traditional, etc.?	Do you use the river for other purposes?	Is your community interested in participating in the consultation process?	Tentative Scheduling
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

	FN/ Organizations Short List	Contact	Status	Reasons for selection- Geography I.R. lands Traditional Lands Outstanding TLE claims?	Treaty/ No Treaty	Does your community have any outstanding TLE claims near Assiniboine River?	Does your community have any interest in the Assiniboine River?	Does any part of the river apart of your traditional lands?	Do you use lands on or near the River?	What do you use them for? Swimming, Fishing, recreational, economic, social, traditional, etc.?	Do you use the river for other purposes?	Is your community interested in participating in the consultation process?	Tentative Scheduling
7	Swan Lake First Nation - Indian Gardens 8	**Chief Larry Soldier** Bob Green- Economic Development (1-204-836-3008) T:1-204-836-2101	LM on 12/11/03 LM on 14/11/03 LM on 17/11/03 Told to call BG on 19/11/03 LM for BG on 19/11/03	Swan Lake is located 31 Km south of the Assiniboine River. Indian Gardens 8 is approximately 1 Km south of the Assiniboine River.	Treaty 1								
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]

	FN/ Organizations Short List	Contact	Status	Reasons for selection- Geography I.R. lands Traditional Lands Outstanding TLE claims?	Treaty/ No Treaty	Does your community have any outstanding TLE claims near Assiniboine River?	Does your community have any interest in the Assiniboine River?	Does any part of the river apart of your traditional lands?	Do you use lands on or near the River?	What do you use them for? Swimming, Fishing, recreational, economic, social, traditional, etc.?	Do you use the river for other purposes?	Is your community interested in participating in the consultation process?	Tentative Scheduling
[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]	[redacted]
13	Tootinaowaziibeeng Treaty Reserve I.R. 63	Chief Barry McKay T: 1-204-546-3334	LM on 12/11/03 LM on 14/11/03 NA on 17/11/03 Called 19/11/03 No one in office	Located 35 Km east of Lake of the Prairies.	Treaty 4								

APPENDIX H – Summary list of comments/questions/concerns

[illegible]	[illegible]	[illegible]
Agricultural	Regarding the compensation agreement, are you referring to land that's right near the river? How far off the river are farmers claiming damage?	Kamsack
Agricultural	The province of Manitoba or PFRA purchased the land, who will own it?	Kamsack
Agricultural	The land covered by the agreement is all water logged and unusable?	Kamsack
Agricultural	Where does the water logged condition area stop? Where does the dry land begin?	Kamsack
Agricultural	What will the land purchased back be used for?	Kamsack
Alternative	Is it the dam or natural causes that cause various levels of water logging?	Kamsack
Alternative	Was the dam responsible for 1995 flooding.	Kamsack
Alternative	Assiniboine River is one of the boundaries of our reserve. If water level changes that could change our boundaries.	Kamsack
Alternative	If the dam was built in 1970, what is the capacity, do you want to make it bigger?	Kamsack
Communication	Say you raise the water 6 feet at the dam, how far north will the water-logged area extend. We are concerned back flooding will go further up the river.	Kamsack
Communication	In the river flats, where flooding occurs now, willows are taking over and hay is dying.	Kamsack
Communication	There is a groundwater effect from flooding, not just surface water.	Kamsack
Communication	Key First Nation has permanent sites for sweats by the river, these will be affected	Kamsack
Communication	If the river increases in size, we will lose pasture land.	Kamsack
Communication	How will information from these studies be disseminated?	Kamsack
Communication	All flats of land along the river are 'bogged out', maple sugar trees are dying as a result of this.	Kamsack
Communication	How many First nations are affected downstream? Is Dakota Tipi one of them? How many other bands are you talking to during this phase?	Kamsack
Communication	Why don't you know those engineering possibilities regarding the gates option, even though you built the dam?	Kamsack
Communication	Does the dam safety analysis include the possibility of the dam failing?	Kamsack
Communication	Were there affect studies done before the dam was built?	Kamsack
Communication	Are there any general upstream studies I can read regarding our First Nation or those further north?	Kamsack
Communication	When are you planning construction? What's the time frame?	Kamsack
Communication	Are you selling the water, for example to farmers? It will be scarce in a few years time.	Kamsack
Communication	Who sets the limits for water use if it's not being sold?	Kamsack
Communication	When water starts going through the spillway, can you control it at this point?	Kamsack
Communication	If everything goes to plan, can you explain in simple terms where you'll build up the dam?	Kamsack
Communication	Will the embankment hold the water if the gates don't?	Kamsack
Communication	Have you ever used the spillway?	Kamsack

Communication	Have you ever considered security measures, similar to a dam in British Columbia where security is high because it provides electricity to the US?	Kamsack
Communication	Does the Shellmouth dam provide electricity?	Kamsack
Communication	If you control the downstream with these gates, won't it be the upstream communities that will be truly affected?	Kamsack
Communication	Are you having these meetings with other groups besides First Nations? I'd like to hear other general issues, as an individual.	Kamsack
Communication	Our major concern is changing water levels which will change our land boundary. It will take land away from our band. Is there a map of the river before the dam was built and then after?	Kamsack
Communication	We have the oldest church in Saskatchewan on our reserve approximately one mile from the river. We intend to obtain heritage status for it. Burial grounds are there as well.	Kamsack
Communication	There is data about the weir in Kamsack including its elevation, backwater, etc. This would be useful to the study.	Kamsack
Communication	We'd like the next on-reserve meeting to be held as a group, for both of our First Nations.	Kamsack
Communication	Gambler First Nation people were promised that land to hunt and fish in their treaty. Will treaty rights be affected by changing the river? Will altering the river create a dependance on the government when we can't fish anymore.	Russell
Communication	Will the wildlife go away.	Russell
Communication / Cultural	The creator owns the river. Seven generations will be affected when you change the river. If you take the river away, will only a scar be left?	Russell
Communication / Cultural	The value of the land will be affected.	Russell
Communication / Flooding	There are supposed to negotiations if the river that goes through our land is affected. You need our permission if you are going through our territory.	Russell
Communication / Treaty	Our fish supply has been depleted by the dam already, there are only suckers left.	Russell
Cultural	The river should stay the way the creator made it, the creator made it for a reason.	Russell
Cultural	We know altering the river will affect us. Who will compensate us for this?	Russell
Cultural	You already have the farmers complaining, why change the dam further?	Russell
Cultural	The dam has done harm to us in the past, why would our concerns be heard now?	Russell
Cultural	We must look out for the next seven generations. We need to know that we will be listened to.	Russell
Cultural	Why don't you give us the money to study it ourselves. We have stewardship of the land and the Elders know the land.	Russell
Cultural	What do you consider 'environmental'?	Russell
Cultural	We believe that all things have a spirit and you are proposing to alter that spirit. The river is sacred to us. We use the river for our ceremonies, we get our sweat rocks from it, we get our medicines from it we use the water for our ceremony.	Russell
Cultural	We see this as a project that is already flawed.	Russell
Cultural	We would rather do business in our own community.	Russell

	[illegible]	
Cultural / Communication	We don't understand this presentation, because we learn by doing.	Russell
Cultural / Communication	Water quality is an issue for us. Our traditional land use has been affected by the dam.	Russell
Cultural / Treaty	Emergency preparedness is important.	Russell
Cultural / Water Quality	When you meet with us in friendship, you should share food and tea with us.	Russell
Cultural / Water Quality	The river has a purpose it gives us life. Even water has a spirit, you have to treat it with respect.	Russell
Cultural / Water Quality	We can't drink or wash in the water from the river, but our wildlife does. Maybe this is because of the dams, or the mines. We want the water tested to see what's in it.	Russell
Culutral	There's another river under the water, our old people talk about it. That's the water that goes into our community, that's why we can't drink the water, it can't be cleaned.	Russell
Dam Operation	When will the water be tested, during the environmental assessment?	Russell
Dam Operation	When you get your list of concerns, what are you going to do with it?	Russell
Dam Safety	We want to be involved in the next steps.	Russell
Dam Safety	Look at the water quality now, before you move ahead. Look at the problems that already exist. There are natural filters upstream, and there is something that has stopped that natural cycle.	Russell
Dam Safety	Our water is our concern. We don't just want to talk about the effects it may have, we want to talk about the effects is already has.	Russell
Dam Safety / Communication	Our band has to buy drinking water, yet we have a river running through our community.	Russell
Economic	We want to know whether there is mercury or fertilizer in our water and how that affects our children.	Russell
Economic	There have been no benefits to us by the dam. How will changing the dam benefit us?	Russell
Economic	We get rashes from using tap water, or in showers. We get rashes from being in the middle of the river.	Russell
Economic	The last trapper left 3 years ago. Because the water level went down so much, the beaver have moved on.	Russell
Economic	There are snails in the water now.	Russell
Economic	Do you have an indication from ethanol plants as to their interest in this project. One of their requirements is their access to natural gas and natural water.	Virden
Economic	Will the dam safety analysis be shared will all the communities along the river?	Virden
Economic	In 1995, what was the cause of the sudden increase of water?	Virden
Economic / Treaty	Water in the reservoir was 3 times the capacity in 1995?	Virden
Economic / Water Quality	Was 1995 a 1 in 100 year flood or a 1 in 1000 year flood?	Virden
Economic / Water Quality	Are your levels low now?	Virden

[illegible]	[illegible]	[illegible]
Environmental	During the 1995 we had a communication problem. The information about the dam must be channeled downstream. We should be informed about dam activity the same as all Canadians.	Virden
Environmental	Are there any other information besides the website?	Virden
Environmental	Our water treatment plant was in the flood zone in 1995. We were in a state of emergency and had to truck in water. The highways department were ticketing our trucks due to lack of communication. We should be informed ahead of time if there is a flood	Virden
Environmental	Since 1995, faxes of information have proven very useful.	Virden
Fishing	Will we be receiving reports of information?	Virden
Flooding	Will the environmental assessment include the information gathered from First Nations?	Virden
Flooding	Sioux Valley is in the valley and the hills. 40% of the reserve base is in the valley. The impact of a flood is very high.	Virden
Flooding	During a flood, Highway #1 acts as a dyke.	Virden
Flooding	Homes in the valley had to be moved because of flooding.	Virden
Flooding	Our water treatment plant is in the floodway.	Virden
Flooding	Farmlands were impacted by floods, after the clean up they had to be re-seeded.	Virden
Flooding / Economic	Soil is impacted, and prime agricultural land. To this day, seepage prevents us from using it after the 1995 flood, the land is spongy.	Virden
Flooding / Water Quality	We've done tests, we already know there have been environmental impacts. We hope this information will be considered.	Virden
General	We're hearing that others have more control over the dam.	Virden
General	We are impacted by the dam, but we have not seen communication. If Brandon can get a report of dam activity immediately, we should get one too.	Virden
General	We accept that emergencies happen, there could be seepage again. We need the opportunity to respond.	Virden
General	Sioux Valley has done a lot of environmental studies, of 400 homes in our community. There has been contamination of land and water.	Virden
General	What is in the water when it floods? That water comes in to our community, how do we change that impact?	Virden
General	Who controls the dam?	Virden
General	The story that we get is that the dam is controlled by sports fishermen. That's why communication is important.	Virden
General	We accept that the dam is there for a reason.	Virden
General	1995 flood caught us off guard. It cost us 2 million dollars. We had to go after the Federal and Provincial governments for help. Farms east and west of the highways were dyked but we weren't. Only the water plant was dyked after 1995. We could put a	Virden
General	We have plans to utilize the water, irrigation and a proposed ethanol plant.	Virden
General	If there are any changes to the dam, we would like to be involved and have input. Our leadership wants to see that.	Virden
General	If we flood again, is there compensation, for example if our alfalfa fields flood.	Virden

[illegible]		
General	We would prefer meetings in our own community if the project proceeds. Bringing all the DOTC bands together would be better.	Virden
General	Funding is needed for cleanup after floods. Fences are knocked down, logs are in the fields, hay is needed. All farmers need this, on and off reserve.	Virden
General	The impact of flooding is great in our community. We have to move cattle, find shelter for our people. Shellmouth may be many miles from our community but it affected our community.	Virden
General	Sioux Valley has a lot of interest in this dam, it affects 2000 people of our community.	Virden
General	We're preparing to protect our sewage treatment plant from flood. We want a say in what goes into the Shellmouth Dam.	Virden
General	We as Dakota Nations know from living on the river that water is life, it gives life to everything. We can't eat the fish from the river.	Virden
General	Our ancestors used the waterways to travel. People traveled to the meeting place on the river. The waterways are very important to our people. It means survival to us, like our plants, our medicines.	Virden
Treaty	Modern health care may not be around for long and we may have to go back to our traditional healing ways.	Virden
Treaty	We are thinking about what's going to happen to our grandchildren. 10 - 20 years from now, our community's land base won't be enough. By 2023, our population projection is twice as many people (4000) in a 6 by 3 mile area. If flooding continues and tak	Virden
Treaty	If the dam fails, will you tell us?	Virden
Treaty	Self government means all First nations need to be informed on a nation to nation basis.	Virden
Water Quality	Long Plain has irrigation plans to increase land revenue which involves 6000 acres of land irrigated to local farmers over 3 years. This initiative is well into planning stage and involves JR Simplot, INAC and PFRA and Long Plains' Economic Development C	Portage
Water Quality	Will this affect / be affected by the Garrison project? Will the Garrison project be considered? This kind of possible spillage is unnatural.	Portage
Water Quality	We will be using the water. Our people have always been users of the river, for trapping, transportation. Is there enough water for everyone downstream including us?	Portage
Water Quality	We will not abuse the water, we want to build our own reservoirs for scarce years. We want to everything we can to preserve the water, to take only what needs to be taken and put it to good use.	Portage
Water Quality	We want to increase land revenues with irrigation and the river needs to be healthy.	Portage
Water Quality	Not too many of our people fish nowadays.	Portage
Water Quality	Long Plain leases land to local farmers, we don't farm the land ourselves. As land managers we need to take good care of the land.	Portage
Water Quality	People stopped fishing in the 1960s, but they relied on it for their livelihood before then. They relied on the fish and the berries that grew on the river. They used the wild grapes in their daily diet, cranberries, medicines.	Portage
Water Quality	Fishing is done with a rod and reel now, it used to be nets across the river. You used to be able to see the bottom of the river, now you can't.	Portage

[illegible]		
Water Quality	Water usage is going to increase from other things besides irrigation, like housing.	Portage
Water Quality / Alternatives	We have property near Portage la Prairie. Proposed uses include a hotel & casino, travel stop, museum, correctional institute. These will all use water resources	Portage
Water Quality / Cultural	Don't forget that as long as the water flows on the river, we need to be informed. Communication is important to us.	Portage
Water Quantity	Outside the reserve freshwater is being provided to farmers through the water services branch.	Portage
Water Quantity	How will the dam impact underground aquifers that we rely on. This is where we get our water from.	Portage
Water Quantity	Have you considered effects on Hutterite people? They are very separate and may even be dealt with the way First Nations have.	Portage
Water Quantity	Wildlife can be changed by diversions like this. An example is unnaturally competing species of fish.	Portage
Water Quantity	Have you considered putting this information on APTN or NCI radio? This would inform people right in the communities, especially shut-ins and elders.	Portage
Water Quantity	Community visits would be beneficial, and broadcasting your recommendations on reserve radio.	Portage
Water Quantity	Long Plain can be a central area for community meetings. Hutterite people can be included, we have a good relationship.	
Water Quantity	We appreciate your prayers and smudge. Most communities respect your way of doing things, as long as you do it.	Portage
Water Quantity & Quality	Consider the ripple effect of the river. If we're having problems up the river it will come down to you.	Portage
Wildlife	You should do a 'canned' PowerPoint presentation, with explanations, etc. for other communities This way they could watch it at band meetings or at their leisure.	Portage
Wildlife	Committee needs to visit the First Nations so the people can show them the issues first hand.	Portage
Wildlife	Committee needs to have meetings on First Nations during environmental assessment so that the community understands the project.	Portage

APPENDIX F
Stakeholder Meeting No. 1
November 26, 2003 at 9:00 a.m.
Portage la Prairie
Issues Raised by the Participants

MEETING NO. 1
CANAD INN – 2401 SASKATCHEWAN AVE.
PORTAGE LA PRAIRIE, MB
WEDNESDAY, NOVEMBER 26, 2003
9:00 A.M. – 12:00 NOON

- What is the maximum safe water level?

- With an increase in capacity behind the dam, will you increase flows on the Assiniboine River?

- Has any consideration been given to climate change?

- Re: modelling, if we need to maintain minimum flow in the River, are we also accounting for downstream irrigation losses? Irrigation also causes extra nutrient loadings back into River; has a dilution factor been considered in terms of the extra flow needed to accommodate this? There is also potentially an increased cost regarding downstream water treatment to supply users.

- Re: evaporation; we should design reservoirs deeper with less surface area to minimize evaporation losses.

- Is the water flow of 200 cfs at Headingley strictly for sewage dilution?

- A question regarding design – it will capture more spring runoff; will the winter drawdown level stay the same?
  - Will the gates not be operated at full capacity initially?
  - Increased water capacity could be phased in.
  - Do you anticipate greater future flows on the Assiniboine River?

- Does the Project take downstream reservoir areas into consideration, e.g., in Portage?
  If Assiniboine River flows are high during a Red River flood, the City of Winnipeg will likely be flooded.

- Concern regarding ability to use water and discharge wastewater into the Assiniboine River. e.g., we need to maintain stream flow but we have lost storage capacity at the City of Portage – the reservoir capacity has declined because it has silted up.

- Regarding irrigation, whatever water you take out for irrigation will go back to the river; later in the season, this can cause algal blooms.
  - Shallow aquifers feed into the River.
  - We want to ensure water quality is maintained – will there be an issue on this?

- Spring runoff occurs in a different season – it is not agricultural runoff at that time.

- (1) What is the current river allocation for the various purposes?
  (2) Are there no numbers now regarding increased minimum in-stream flow needed for fish?
  Irrigation increases by 3-4000 acre/yr in Manitoba; irrigation amounts are 4 inches (average); a new potato-processing plant would increase the amount of irrigation.

- Is an analysis of future economic impacts part of the analysis of the need for additional reservoir capacity? For example, an additional 10,000 acre-feet of water would result in $400 Million in crop sales

- You need to finance the project appropriately.

- We want to ensure we have clean water.
  - Farmers can mitigate more with on-field practices; practice watershed management.

- Would there be impact to the Portage Diversion?
  - Would it decrease/increase the frequency of use?
    - This has been concern of cottage owners on Lake Winnipeg.

- Do the alternatives include building another dam elsewhere?

- Regarding the range of engineering options, what are you looking at that in this study? e.g., off-stream storage, other dams, a dam at Treherne? The project alternatives have quite a big scope.

- Regarding the increase in the reservoir:
  - Will you look at the practice of clearing the areas to be flooded, e.g., strip and remove standing vegetation?

- There are possible economic benefits from increased water-resource availability.
  - There are also many social-cultural benefits from the spin-offs of these economic benefits' e.g., increased potato processing around the City of Portage.

- Water flow at the Lockport Dam (on the Red River) varies; is this linked to the operation of the Shellmouth Dam?

- Would interprovincial and local water allocation priorities remain the same?

- It would be useful to have this information (presented by T. Kettler) and other information on the Project available on a website.

APPENDIX G
Stakeholder Meeting No. 2
November 26, 2003 at 1:30 p.m.
Portage la Prairie
Issues Raised by the Participants

MEETING NO. 2
CANAD INN – 2401 SASKATCHEWAN AVE.
PORTAGE LA PRAIRIE, MB
WEDNESDAY, NOVEMBER 26, 2003
1:30 P.M. – 5:00 P.M.

- From an economic perspective, this is a very positive move. We should also be looking ahead to another reservoir expansion, beyond the scope of this project.

- Regarding the economic study, how can we do proper projections without knowledge of the amount of water being taken from river (i.e., water use) under terms of existing Water Rights Licences)? Will this Project help in reducing the backlog of Water Rights licence applications?

- The Association of Irrigators of Manitoba (AIM) thanks you for being involved early in the process; we appreciate being asked vs. being told about final decisions.
  - Newsletters with progress updates would be appreciated as the project progresses.
  - There should be money available for compensation of downstream impacts, given the upstream compensation.

- I would like to see a pdf document of the scoping study available for download and e-mail.

- How far back towards Kamsack would these gates affect the land?

- If the reservoir surface-water elevations were higher, with the associated increase in storage, and assuming the gates are up, will the current dam elevation (i.e., the freeboard) be sufficient or could water go over the top?

- Regarding the 1995 situation – if we had this flood situation again, but with a gated Dam, would we lose the structure?

- If the land is going to flood, let it flood because these flows are early in the season (the land is not thawed); if there is going to be a flood, don't try to control it or slow it down if this would cause a flood later (when land is thawed and farmers experience increased damages).

- This project is very positive; raising the dam should be a priority economically; we should also build other dams to hold water back and provide water when needed. We need to think about the provision of water as a resource. What is the maximum storage and water flows possible on this river?

- Will the Project help to release demand on the Assiniboine Delta Aquifer and therefore result in more water to use locally for irrigation?

- If Shellmouth storage is not viable – we need to look at other storage options; if we increase the reservoir, this increases surface area and evaporation, are there other channels that are deeper?

- Would building additional holding areas be more difficult or easier?

- Regarding the change in drainage patterns, and other tributaries that are contributing to the flow downstream; could drainage be withheld (slowed down and kept longer on the land) instead of hitting the river immediately and becoming lost to Lake Winnipeg?

- Is there any hope of building weirs in the River along the way; e.g., Portage – 4-6 ft, to hold water back?

- How significant is the fisheries issue on this Project?

- Downstream concerns (south of Highway 16) exist; we have suffered enough for the water supply and flood protection benefits created for the rest of this province at expense of others.
  - I am encouraged that there is a study, but at meetings 10 years ago this was an issue.
  - I do have a positive attitude towards this project regarding provincial need; it will help to diversify economies in Manitoba by keeping water to use it (irrigation and industry).

- Re: the 1995 downstream study, we were told that if we live in a valley and get flooded, then there is no compensation available.
  - In 1997 the Red River flooded; these farmers got compensation.
  - In 1999 everyone got flooded; still downstream Assiniboine River residents were not eligible.
  - Have to get past benefits arising only from Portage and Brandon.
  - What about a good rural water supply; e.g. water pipelines.

- What does DFO say regarding the projected level of the water?

- Shellmouth Dam has been good for fish and recreation; if we raise water levels, I think it would be better; I've been fishing, camping there – higher water seems better.

- How long does it take fish stocks to become established in a larger reservoir?

- We were surprised because initially we thought Shellmouth wouldn't be good for the fish. The walleye fishing is now known internationally.

- Is there a link between floodway and this Project? What are the impacts of decisions and this project in the City of Winnipeg?

- The minimum levels maintained for the City of Winnipeg are there to dilute its effluent.
  - There have been problems with the flows of the Assiniboine River in the past (e.g., bank instability, the size of river increasing and the bridges aren't; the erosion is phenomenal, 20-30 ft can be lost; riparian habitat is lost).

- As a downstream user/irrigator, I look at the River and think if it were a little bit higher more often it could be a good thing.
  - Riverbed land is harder to farm; if floods were early, it would be better because there would still be frost in the ground.
  - Now we are holding back water that already came through in 1995; the ecosystem dealt with it; if we were to raise the surface water levels in the Assiniboine River gradually (e.g., 1 ft a year) think it could be simple and that the environment could handle it.

- Changes in the environment going back 30 years have created an unnatural situation with the reservoir; the development of tourism can take the lead (e.g., economics); we need to recognize that much change has already taken place (e.g., trees removed/flooded near the aquifer); but change will continue to happen, and is needed for province.

- Re: a build-up of silt in the reservoir, is this a problem?

- I'd like to see more even levels, less peaks and valleys in the flow of the river.
  - We want to see/know about the operating regime.
    - Re: pumping off riverbanks, issues in how low river gets; whether to invest in pumping, etc.; if we could have more even, higher (better) flows in 2 summer months it would provide great benefit for agriculture.
  - We are told that we are not allowed to touch the banks, so we make a channel that ends up silting up, then we can't get water.

- If there will be a negative impact on fish and aquatic habitats what about planning a positive impact elsewhere to try and appease DFO, e.g., enhanced flood control, improve erosion?
  - Re: irrigation methods (e.g. pumps in the river), it seems like the little bit of disturbance that we create is nothing compared to what happens during a rainfall or the spring melt sediment loading.

- We (farmers) are trying to self-insure ourselves so it would help to minimize flooding to our land, e.g., by providing bank stabilization.

- Regarding alleviation of past problems, there is a lot of uncertainty – people do not know if compensation will be available, for what, when or how much. When certain, predicted degrees of impact are reached, we should know that assistance is available; too many times we think we can get assistance and then we don't.
  - The amount of money is not the issue; our not knowing about compensation and the uncertainty is more the issue.
  - What would the downstream issues be if this project went ahead?
  - Floods are now higher, longer; it's harder to drain the land and therefore get on the land to seed.

- If the upgrade goes ahead and operation occurs in a way that keeps more water in the river and at more even levels, it's better for irrigators.
  - If the government is planning on only raising water levels in the River or allowing the water to go faster through to Lake Winnipeg, it will create more difficulties downstream.

- Other implications include social unrest.
  - The downstream issues are not only related to Hwy 16; they go all the way to Brandon; I'm tired of hearing that the project is only impacting a few km downstream of the dam; will the upgrade meet major concerns as it goes upstream?
  - Farmers have been flooded near Brandon.
  - I have been flooded and had to put soil back into holes caused by flooding.
    - Re: operational aspects – the bank-full flow is now held up longer than natural; e.g., the water level is only inches below top of the bank and then you drop the water level down and the bank fails. Are you closing the gates too quickly?

- There is bank instability, and bank incutting; it's causing undercutting of trees and then the banks are gone; the floods are now longer and later since the dam, creating more damage than previously.
  - Riverbanks exist in different elevations and some water gets held back after flooding, and on this land the water remains.
  - The steep banks caused because of undercutting are causing cattle to fall over into the river and new problems for us.

- The duration of water levels in the spring does the most damage; the ground softens up; if you can hold the water back to keep more consistency, hopefully there will be less damage to banks and it will be there earlier to irrigate.

- Can we enhance the role of the Shellmouth Liaison Committee and use this as a more effective tool for communication?

- It is nice to have access to the Shellmouth Liaison Committee; once when I put in an irrigation pump, the river then dropped 11 inches in a few days; it helped that I could call Lorne Henry who is on the Committee.

- If these streams/tributaries that are feeding into the Assiniboine have a lot of flow, could we hold water back on these?

- The Souris River has made significant contributions to the Assiniboine River (especially in 1976), which increases flooding; you should look at the streams along Assiniboine River as options regarding water storage.

- Regarding the technical aspects of forecasting – will there be more emphasis on this in the future? It is important regarding management of the dam.

- If you are looking at raising the reservoir by 6 ft, this would suggest that you would also change the operating range. But are you currently still planning to bring water levels down to same level as without the gates? This would increase the operating range.
  - To increase the water in river level during summer months, you should look at a variety of operating scenarios.

- Spring water rushing by is seen as a lost opportunity for farmers; we would have loved to have even a pail of this in August.

APPENDIX H
Stakeholder Meeting No. 3
November 27, 2003 at 9:00 a.m.
Brandon
Issues Raised by the Participants

MEETING NO. 3
AGRICULTURE & AGRI-FOOD CANADA
BRANDON RESEARCH CENTRE
18TH STREET & GRAND VALLEY ROAD, BRANDON MB
THURSDAY, NOVEMBER 27, 2003
9:00 A.M. – 12:00 P.M.

- If you are looking at raising the level in the River, is there any potential for Hydro to put slow moving turbines on it?

- The City of Brandon may want to be involved further in this Project. Can we indicate further interest via the mail-back card? (e.g. community protection, emergency warning system for flood events).

- When planning this Project, you should consider the historical landscape, for example, if a beach gets flooded by the Upgrade but it wasn't actually there before the creation of the Dam, is it really lost?

- Regarding this Project, isn't the expanded capacity more than 10,000 acre-feet?

- If the water flows past us and is not managed, it will be lost to Hudson Bay.

- I would like a better understanding of what would happen on the other side of bank (i.e. on the reservoir); how often would water overflow the spillway?

- Is the water level of the river going to exceed the riverbanks, given these changes?

- How far downstream are you studying?
  - During the flood in 1995, our land was under water for 2 months; we received no compensation (despite money being available to farmers in the Red River Valley in 1997).
  - In 1999, we were wet again.
  - People downstream of the Dam are tired of feeling neglected by the government.

- The floods and river flows are no longer natural. There are also flow problems with drainage projects south of the dam that are not controlled and are impacting the river. There were mismanaged operations in 1995. We got a letter from Water Resources that they would close the gate and then later that April the flood was out of control; the dam was poorly operated.
  - You weren't listening to people up north; there was lots of snow and we were all predicting a flood.

- The river is getting wider than the bridges; we are cut off from our hometown; school buses had to travel 50 km to get to Virden.
  - PR 259 was cut off.
  - The RM can't afford to rebuild the bridges.

- What kind of historical data is used to operate the Dam?

- Can you estimate what flooding would have been like before the Dam?
- Manual snow levels used to be taken by people, in the communities on the Assiniboine River to get accurate levels vs. Environment Canada Information.
  - People knew 1995 would flood; need to keep people doing manual records.

- Shellmouth is not the only source of water on the Assiniboine River:
  - Is operation done in concert with dams and flows on other rivers (e.g., Qu'Appelle River, Souris River)?
  - Satellite images are bad for forested environments and therefore it is hard to get accurate data. Snow surveys are also needed!

- Regarding the 10,000 acre-feet and downstream water licencing – would you use this number, or more, as an average for future allocations?

- If this Project could increase the capacity of the reservoirs it could help with water management and provide flexibility if poor management occurred.

- Regarding the bridge and roads (e.g., #259) in Virden and Griswold; when water backs up at the highway bridge, the whole road becomes a dam; during high water years, we lose the road.

- When water was on the land for 2 months in 1995, it was the worst we ever saw; then the river water went down quickly and we lost the banks (they collapsed).

- Do we know the level of sediment build up behind the dam?
  - When major releases, turbidity and nutrients levels increase; we believe the dam is stockpiling this.

- Why use gates to increase the capacity of the reservoir, in lieu of a solid/permanent increase (i.e. raising the concrete spillway)?
  - Would Dam operation be different?
  - We need an emergency preparedness plan for downstream communities in case the Dam fails.

- Regarding dam safety:
  - Do we know when the dam would fail?
  - Why was spillway built at this elevation? Why not higher?
  - Will there be increase in upstream force (increase pressure from additional 6 ft)?
  - Are there gravel drains downstream?

- In the 1992 modeling – was evaporative loss included?
  - Have the effects of climate change been considered?

- Regarding minimum in-stream flow, I would suggest that we don't want a number; at a conference in October, a number was presented for Brandon for sturgeon completing their lifecycle.
  - If we are looking at restoration of riparian habitat and the ecosystem, the numbers are significantly higher at certain times of a year than others.

- Regarding in-stream flows, this may result in more water, but only at certain times of the year.
  - This approach is to replicate natural system and therefore we may not get water when we need it.
  - They are doing in-stream flow requirements at 22 spots on the river.

- Regarding slumping banks; in 1995, you cut down the flow too quickly.
  - please don't do that again.

- In 1995, we had trouble with municipal roads. The R.M. of Woodworth had an engineering study done that indicated that 30 ft underground there is a sand layer that comes out near the river and caused the road to slump.

- Regarding flows and flow rates, the City of Brandon has a new water treatment plant designed for current conditions; it is susceptible to turbidity – this is a major concern for us. We had trouble this spring with turbidity.
  - We may have to make changes to our filtration system.

- Regarding the Shellmouth Liaison Committee, there is not a producer on the Committee from between Brandon and Highway 16.
  - In September the R.M. of Woodworth received a letter from Manitoba Conservation saying it would be represented; it also states that there have been no negative effects from the dam, that we are no worse off because of the dam.

- The Assiniboine River Advisory Board used to have downstream representation. We have reports from this group that were filed with Minister's office. There has been a lost government capacity to continue the work of this Board.

- Regarding the report on the Upper Assiniboine Basin – some people here would like to irrigate, store water; because the river crosses boundaries this can be a problem (MB/SK).
  - The provinces need to communicate on allocations.

- There have been EIAs done for other projects on river; Tetr*ES* could identify issues raised in these documents that could be useful.

- We need a review of the catchment area behind Shellmouth.
  - How would runoff from these watershed areas change; we need to identify areas that need protection from development (to protect the environment and reduce runoff into the watershed).

- I am concerned about the riverbanks especially on the river's curves, it looks like the river might change its course; there are two sites on my farm that have sloughed in. Water levels are higher and longer all summer long and cutting into the bank.

- Bill Patton has studies done by John Welsted on river morphology.

- There has been a lot of drainage between here and Alberta. Under the right conditions, the land is open like a big valve;
  - We have created a monster because no one wants any water on their land.

- What is the big plan (hidden agenda) for the Assiniboine River?

- Before the dam, there were ice jams on the river; now the ice flows out.

- These Projects issues are more concerned with water supply downstream then with flooding.
  - But many of the comments here deal with flooding and this needs to be addressed by the upgrade – better operating rules are required.

- Regarding other tributaries and drainage – will you think about holding this water back?
  - Also, now have higher levels in the river before the freshet; before the Dam, the river used to be mostly empty at this time in early spring.

- Reservoir Operations – are the operating rules firm? Can they be improved?

- Could Manitoba Hydro place a turbine on the dam?

- The beaches on the Lake of the Prairies were not present years ago.

- Will the conduit and its gates change? Does the use of spilling happen regularly?

- Will the surface water level of the Assiniboine River change?

- Which locations will be included in the downstream studies? I suggest Virden, Oak Lake and Miniota.
  - In 1995, 1997, 1999 we were badly flooded. We have not had any compensation.
  - We need controlled drains.
  - The Dam was not operated properly.
  - The Water Branch did not listen to producers.
  - The downstream study should extend to Brandon.

- What are the dates on when the Dam did not prevent flooding in the past?
  - This needs to be addressed.
  - Are there other water availability issues?

- There needs to be manual data collection of water levels and drainage data.

- Satellite imagery is really bad in forested areas. There needs to be more money to hire people to collect the snow-depth and other monitoring data.

- What about keeping the currently low level (as per current operation of the reservoir) and then increasing the high water level to increase is the capacity of the reservoir?

- What about Water Rights licenses and more water availability? Will more water be available to be allocated?

- Will the raising of the gates cause an additional 100,000 acre-feet of water availability downstream?
- Are bridges built to a standard to service flooding over the spillway?
- Is there any knowledge of the level of sedimentation in the reservoir?
  - With major releases, TSS and nutrient levels will increase in Brandon.
- Why was the spillway constructed at that height? We need to understand dam safety above current gate levels.
  - You need to model for greater depth.
- Has evaporative loss been included in your modeling?
  - What about the Instream Flow needs? What about restoration of damaged riparian areas.
- Will instream flow allocated for fish create more water for downstream users?
- In 1995, all water flow was stopped and it lowered the level in the river to 10 feet, then the riverbanks fell. Do not do this again!
- We are concerned with higher turbidity.
- We are concerned with changes in flow rates.
- The liaison committee does not include any producers.
  - Will downstream study only compile old information? Will it collect new data?
- Is water storage in the Upper Assiniboine River being addressed?
  - What about cross-border allocation issues?
- Land-use development and protected areas may need to be addressed to control runoff to the reservoir.
- We're concerned about riverbank stability and how it has changed in the last 20 years. The river will change its course if planning is not done.
  - What about planning for diverting water off farms? (look at 1995).
  - There is a need for solid long-term planning.
- Residents and stakeholders need to have continuous updates on the process of the study.
  - There is need for a summary of comments from these meetings.
  - There is need for a website to allow feedback to be sent to government.
- The real issue is providing more water downstream.
  - How much water does the river hold from Shellmouth to Winnipeg?

- The river before the Shellmouth Dam was typically only half full.
    - We have longer periods of flooding since Shellmouth was built.
    - The Dam has also caused flooding. We need to do this change (an upgrade) the "right way" this time.

/sr
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APPENDIX I
Stakeholder Meeting No. 4
December 1, 2003 at 3:00 p.m.
Kamsack, SK
Issues Raised by the Participants

MEETING NO. 4
CROWSTAND BUILDING, ROOM 204
241 SECOND STREET
KAMSACK, SK
MONDAY, DECEMBER 1, 2003
3:00 P.M. TO 6:00 P.M.

- Will the Project provide more flexibility regarding flood control and water release?
  - What are the effects of the drawdown?

- Is the government of Saskatchewan interested in holding back water? What is the forecast for water in the future? e.g., what would happen in dry years if SK needs the water and then MB decides to open the gates and SK becomes short of water?
  - In dry years, farmers want water; in wet years, they want it gone.

- In 1995, the winter water levels were kept higher despite the amount of snow we had.

- If a big flood were expected, would the gates just be kept down anyway?

- If water levels were held at the top of the gates, could this more than double the capacity of the lake?
  - What is capacity of the reservoir with the new gates?

- What about fish passage and DFO; the Dam currently doesn't have fish passage, will it be required during the upgrade?

- I believe Saskatchewan couldn't issues a licence for a person wanting to access this water; access for water supply is an issues since part of the water is in SK but the dam is operated by MB; currently, there is no demand from SK, but would SK have access to the reservoir for future water supply?

- Land control – does the negotiated agreement with the Kamsack landowners allow for the raised water level that would be a result of an upgrade. Would any land be turned over to SK?

- In a 1995 flood situation and with a 6-ft gate – when would water be off the fields in the Kamsack area? What about roads (SK Highway No.8) and bridges (e.g., at the end of May or July)?

- Re: the land proposed to be flooded; occasionally holding water on the land would turn it alkaline, what would grow there?
  - Over time with water pooling on the land, will the value of the land be reassessed and reduced?

- How long will the upgrade process take, i.e., to end of construction?

- Looking downstream, are there any other locations were you could build a dam? (i.e., that wouldn't flood the SK area)?

- What are the future expectations for water (regarding wet and dry years)? Do the predictions include flooding?

- I am concerned that if we are due for some dry years, and with the farmers draining their fields, if this happens then we will be looking for water. If MB starts letting go of water in the reservoir, what about SK?

- People need more information on the modelling you've done and the predictions of frequency of effects.

- Our situation is like a double-edged sword – we don't want the land flooded but we need water (and there can be storage); access to water in the reservoir for storage could possibility change this situation for us.

- Is there a similar situation we can look at to determine potential impacts, to learn from that situation?
  - We should benefit from looking at others' lessons; we shouldn't "reinvent the wheel".

- There are legal problems regarding the authority of the EA *Act* in SK; SK typically allows a certain amount (e.g., 50%) of water to cross into MB but once it has crossed the boundary we have no authority.

- There is nothing there (physically) to keep this allocation back.
  - Currently in SK the demand for this water doesn't exist at a cost that the R.M.'s or industry can consider paying.

- Legally, how does Saskatchewan (municipalities, industries) access our water in the Assiniboine River when another jurisdiction (i.e. Manitoba) owns and operates the Shellmouth Dam?
  - This is an issue for the inter-provincial board.

- Maybe SK needs to keep some water back.

- I am more worried about dry periods than floods.

- Are there any known aquifers in this area we could drill and take new water from?
  - R.M. Kamsack rationed water this year; we're under a drinking water advisory on right now.

- With the gates, operation will be at a higher level;
  - Will it change flood level during flood events? Will there be backwater effects?
  - Are operations dependant on flood forecasting?

- When the water backs up, what happens to the tributaries that feed to the river here? e.g., Two Creeks runs into Assiniboine River; it runs about the same time as the Assiniboine River does in the spring.
  - In 1995 we went through a dry-out; will riverbeds be lost on tributaries, and in fish spawning areas; as banks slump backwards further?

- If water doesn't recede until the end of July, will there be impacts further north? On our bridges?
  - How far will upstream impacts be felt with this upgrade?
  - Will it further slow the flow?

- The provincial government (SK) leases lands within the take line.
  - The SK government administers the land below the takeline but leases it to adjacent landowners.
  - The SK government has amended the flooded acres clause; land tenants are contacted in the summer to gather information on flooding and the government then charges rent accordingly (i.e., tenants wouldn't pay rent on these areas at certain times depending on the flood conditions).

- The lands are already slow to drain; with this upgrade they may be slower to drain.
  - Will we have the ability to continue to farm those lands?

- As you go down further 5, there is more hay and pasture, right down to the flats, more cultivation.
  - This land may be lost to annual crop production but could have opportunity still for hay and pasture.

- Regarding the communication strategy for the project and leaseholders etc. – is there one being developed? I want to be in the communication loop.

- The SK government may ask PFRA Manitoba regions and Manitoba Water Stewardship to come to Regina to talk about the technical aspects of the Project.
  - Given the multiple jurisdictions and issues for this Project, who would be the Federal Environmental Assessment Coordinator for the environmental assessment?
  - This is an issue because SK *Act* deals with projects via impacts versus operations; SK Environment would trigger our involvement via CEAA and the inter-provincial boundary involved.

- SK government would like to work with the Steering Committee/Project proponent along the way.

- Right now, with low water levels on the Lake of the Prairies, some "concerns" are likely not "issues". Right now, you can almost see the road (that was flooded when the Dam was first built), but what about water levels in wet years?

- When the Dam holds back water and then we get a rain, our crops will be under water. What will happen if the new "gates" hold more water back?

- If SK Agri is adminstering the land, (i.e., below the takeline), what will be the goal for this land?
  - Agriculture? land for wildlife? (i.e., will the lease agreements change?).

- Would crop insurance or compensation change for different flooding scenarios? The leased land within the takeline (e.g., is it considered to be at an increased risk now)?
  - We have to pay insurance on the land whether it is leased back or owned.

- Regarding the water quality – cattle along the river are using the Assiniboine River; when will Sask Env. get involved to prevent this? e.g., farmers here been contacted by Env. regarding cattle on creeks and asked to move them.
    - Right now a lot of cattle are being watered right on the river. How do they compensate these farmers for additional costs that are needed to alter these practices? (i.e., of pumping water so cattle can drink without going down to the river)?
    - There is a fence built using a cost-sharing approach (with SK; in SK watershed) on Little Boggy Creek.
- Will cattle operations change?

- What if we had a sewage spill in the Town of Kamsack – (which we have had in the past) and water were to backup? What are the implications, liabilities?

- There is a potential for a lack of consistency between the existing Provincial SK and Federal lease agreements negotiated recently (SK takeline and Federal Shellmouth property purchases).
    - Will leasing agreements be equitable?

- PFRA has compiled a database of the lands that were taken for the creation of the reservoir.
    - SK Agri wants access to this information, e.g., digitized information; layer for GIS.

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APPENDIX J
Stakeholder Meeting No. 5
December 2, 2003 at 9:00 a.m.
Russell
Issues Raised by the Participants

MEETING NO. 5
RUSSELL & DISTRICT COMMUNITY CENTRE
106 SHELL RIVER AVENUE S.
RUSSELL, MB
TUESDAY, DECEMBER 2, 2003
9:00 A.M. TO 12:00 NOON

- What happened in 1995? the gates were vibrating and we thought the dam would be lost.
  - The Dam was supposed to stop the flood and I got flooded; floods in the 1950s didn't do the damage the 1995 flood did. (See my photos of the damage).

- My land is 20 miles south of the Dam and is used for agricultural; if we'd had the whole 1995 flood (e.g., with the dam double/triple the water that came through), the water would have only increased by approx 3 ft, on approx 5% of the land. The Dam didn't make a big difference to my flooding situation.
  - If flooding on my land continues beyond June 20, my crop insurance is no good and I can't make claims.
  - When there is water 1-2 ft deep over land, there is a higher velocity than it there was approx. 10 ft of water, which makes the erosion worse on the land.
  - Also, the floods that occur with the Dam are later when there is no frost in the ground anymore – this creates more damage.

- We have a big issue – the downstream farmers were never compensated after 1995; the extent of the negative effects downstream were never acknowledged by the government.

- There is a consistent lack of upstream information to accurately predict inflow to the reservoir (the weather stations are gone, land and snow surveys are not done).

- The Dam was designed for flood control; at some point, this priority/emphasis changed to water storage/supply.
  - Downstream investments have been made, e.g., more roads, bridges; mitigating the impact of additional inflow from improved drainage.
  - In 1995 we had a warm hot spring; there was no frost in the ground, and drainage lost = huge problem, this negates the effect of the dam.
  - The landscape is not the same as when dam was built; the government needs to reassess the water levels in the Assiniboine River.
  - There must be a better balance between water for downstream needs and immediate downstream issues – i.e., individual farmers in the Lower Assiniboine Valley have been really damaged.

  Since 1995, water is 3 ft higher than before – the river appears to have been silted up. See R.M. of Ellice, S25, 1829;
  - what consideration is made of the flows in the tributaries when controlling the water?

- Regarding the information that came out of Upper Assiniboine Study – is it useful for improving the operation of the dam?

- How will the impacts of the upgrade be determined?
  - Pre-Dam state to new upgrade state

or

- Current Dam state vs. new upgrade state?

- In the 1950s, the Assiniboine River was teeming with fish; e.g., goldeye, jackfish; now the river is dead, there are very few fish.

- Water quality must be a consideration in your studies.

- You are going over old wounds; you dealt with these issues in the Upper Assiniboine Study; it's been 10 years and nothing has happened.

- There is a lot of water pollution from agricultural runoff and manure. Swamplands have been lost because of drainage and these were our runoff filters.

- Three years ago a water-quality study was done; have there been any results from this?

- Has there ever been a comparison of inflow water quality to outflow water quality?

- Silver Creek has changed so much; it appears that the sediment is stopping (being trapped) here.

- You need to invite elected officials.
  - This is a water-use issue and relates to the whole system.
  - You need to change the agreement because the situation is no longer only 1% for flood control.
  - You need to look at the whole area, e.g., if there will be a cost to people upstream, then people who use water (i.e., benefit) downstream should pay for it (i.e., the cost) or the public purse should pay.
  - Re: surface water elevations; we don't want to see new big fluctuations in the reservoir.

- Regarding water use, will there be priorities?
  - e.g., municipal irrigation, ecological.

- What about a dam at Holland? If they need water there, why not store water there? Or on the Qu'Appelle River, or other tributaries, e.g.;
  - Pipestone Creek.
  - Minnedosa River.

- We also get water where the Qu'Appelle River comes in, and drainage comes in uncontrolled from other side of Regina.
  - What about alternatives to upgrading Shellmouth Dam?

- There will be economical benefits to southern Manitoba regarding better water supply (e.g., to City of Portage, R.M. of Portage).
  - There is a feeling of exclusion in the immediate downstream area.
  - Should there be compensation to upstream RMs that are losing out as others (downstream RMs) gain?
  - We have received tourism benefits.
  - Others and I have put a lot of money into development along the lake, and we want to protect our investment.

- Approximately $3M has been spent on local water quality and effluent management; we can't discharge our effluent into the Shell River therefore the Town of Roblin had to develop special wastewater treatment systems.
  - Others along the Assiniboine River not required to do this.
  - We want there to be equality for all users of the Assiniboine River.

- We have the feeling that we are going backward (vs. going forward) in our dealings with politicians.
  - Downstream damages are real and there has been no compensation.
  - The crop insurance date for seeding protection is too late.
  - The government should buy the downstream land that is flooded and lease it back as has been done in the SK valley area.
  - We feel like second-rate citizens.

- I don't think compensation is what we need; we want to keep land in production, therefore we need better watershed management.
  - There has been talk regarding an inter-provincial Conservation District but nothing has materialized.

- Yes, we want to keep land in production.
  - Holland Dam was initially a useful option but it got dropped when the Shellmouth Dam was considered to be enough.
    - Now this upgrade provides money to look at more flood protection. What is the biggest value for the money? The more we ask Dam to serve two purposes, the harder it is to comply with necessary but conflicting roles.

- Regarding the 1995 flood;
  - The monitoring and modeling was not good enough.
  - If downstream users need more water, will reservoir drawdown go below the minimum recorded level to being effectively empty?
  - It's not fair to prioritize just the downstream economic uses in Portage and Brandon, what about the fish in the river?
  - Look at the Red River Valley flood vs. the Assiniboine River Valley flood; compensation paid in Red River Valley vs. none paid in Lower Assiniboine.
  - There has also been unfairness regarding assessment calculations.

- Compensation should be on a per acre basis; our Assiniboine Valley land is worth a lot on an individual basis but on an overall farm basis it is worth a lot more (for farming production).
  - Regarding potato processing, the water is here but is being kept back behind the Dam. The MB government promised this water to industry to keep them here (vs. leaving for AB).

- Can we see the legal agreements signed in Kamsack?
  - When the government sold the idea of a dam, there were lots of promises – none of which delivered (e.g., R.M. of Shellmouth – Boulton).
  - What is the role of SK Env; how do they see this upgrade?
  - A lot of the comments provided at this meeting were provided by local people. I think this kinds of projects should also be initiated locally further downstream (vs. from the City of Winnipeg); why haven't solutions been developed based on upstream concerns?

- The spring runoff from the fields smells like chemicals.
  - Drainage downstream of the Dam is similar to the issues in Kamsack – water levels are not draining off the land when river levels in the River are high.
  - Reading from the Upper Assiniboine River Basin Study: e.g., cumulative effects – until address issues are raised in this study, how can we go ahead with this project?
  - "No practical method to track drainage".

- What is the basic need for this Project?

- The physical outflow from the Dam outlet has changed – there has been a decrease in bank stability caused by erosion.
  - We have lost ~20% of our in-bank capacity since the 1980s because of the way the dam is operated.
  - Siltation has accelerated.
  - Bank loss is increasing our flooding damages
  - Banks have frost, when they thaw, they just collapse.
  - On the Qu'Appelle and St. Lazare we don't have the ice scouring anymore (along the bottom of the river that used to clear out sediment).
  - Large inflows from land drainage have caused siltation in the River in the spring; there are high levels of vegetation along the River filled in with silt.

- In the 1995 flood, flooding softened the banks as the water level was kept higher for such a long time.

- I'm located between the Manitoba PTH16 and PR478 (S of the highway).
  - My existing situation (i.e., unresolved past downstream damages and feeling of frustration) needs to be dealt with before anything can go forward.

- Have there been any studies regarding siltation levels in the reservoir and in the Assiniboine River over the years?

- The upgrade would increase riverbank and lake shoreline exposure, increase fluctuation of water, and increase nutrient levels (algae problems).
  - Could environmental issues hinder the Project?

- I was on Lake of the Prairies this summer in a pontoon boat with a depth gauge; nowhere was the depth more than 9 ft; as a kid, I remember it being much deeper.

- Downstream landowners lost property assessment value when our area was flooded.
  - In the 1995 flood, the land was stripped away and there was a lot of erosion and subsequent siltation of the river; even in 1999, we lost equipment in the field because of swampy land (a cow died in a crevice, which was filled in by silt, and so it rotted).

- What about repairing fencing along the river? In 1995, we lost our fencing and the government didn't put it back.
  - Local zoning now doesn't allow structures on the floodplain so we can't put it back; a "catch 22" situation we didn't create.

- Regarding operation – if the gates are used but you also raise lowest reservoir level, there will be no change in your ability for flood control.

- The new gates would result in floods that occur later and longer.
    - This is already the case; the gates would just exacerbate the effects of current negative downstream effects of the dam.

- Smith Creek is getting SK's drainage.
    - The bridge washed out, and the R.M. wanted to fix.
    - but DFO said that pickerel eggs are there; there's been no pickerel there for 100 years.
    - The RM lacks the funds to deal with existing issues, especially with such regulatory positions.
    - If you can't get all of this dealt with, I think the Project will be blocked; will it end up in CEC public hearings?

- In 1995, I toured MB Conservation staff around to learn about local damages but nothing jas happened since.
    - In the Assiniboine River Basin Study, I think questions and information requests were not addressed.

- You can't say, "You live in a floodplain expect to be flooded" because dam exists and floods aren't natural anymore.

- There has to be an EIA done under a federal department.

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APPENDIX K
Stakeholder Meeting No. 6
December 2, 2003 at 2:00 p.m.
Russell
Issues Raised by the Participants

MEETING NO. 6
RUSSELL & DISTRICT COMMUNITY CENTRE
106 SHELL RIVER AVENUE S.
RUSSELL, MB
TUESDAY, DECEMBER 2, 2003
2:00 P.M. TO 5:00 P.M.

- What about the floods in the last two years – why did we flood downstream?

- If get a wet snow for 2 weeks after the upgrade, would we still flood? You don't know when we flood downstream of the Dam.
  - Higher reservoir water levels make me think we will be flooded more in the downstream area.

- The issue is poor water management, here and in the whole province.

- In 1995, we lost 6 ft of our 100 ft frontage on the Lake of the Prairies.
  - Now the Lake is safe; in the 1995 flood we lost trees, and the Lake was not as safe.
  - If we were to raise the water level, would the existing vegetation along the banks of the Lake/reservoir be cleared?

- One issue is that there is no accountability within government, no point of contact for us within the government.

- Better overall watershed management is necessary.

- Drainage is coming in from SK.
  - When I raised my concerns, the Minister of Manitoba Natural Resources (now Conservation) told me that MB wants the water.
    - What can we do about this?

- Post the outflow and water-surface elevation on the Internet.

- The R.M. (south of the Dam) didn't know the amount of water let out of the Dam control outlet (we are also below the Qu'appelle River).
  - When will the government enforce the drainage laws?

- If the reservoir level is subject to a 6 ft increase, there will be shoreline erosion; the land is sacred; will there be compensation paid, or erosion control?
  - We are structurally okay now, as we are set back from the lake, but we can walk out to the beach now; will we still be able to do this if the shoreline becomes a cliff with 6 ft higher water levels?

- What about the beach at the Provincial Park?
  - When the reservoir is high, the park will lose the beach and the marina.
  - People use the Park for recreation.
  - West side of dam, near the spillway is a good fishing spot, (this local fishing spot is known as Seniors Point).

- In 1995 there was water over the beach, and the boat launch, and the washrooms flooded.
  - The perfect water level is right at the stones (i.e. the rocks leading into the spillway).

- The Lake could hold 2.5 to 3 feet more water, but 6 feet is too much.

- Are there other alternatives? Other than Shellmouth Dam?
  - What are these?

- When the money is calculated for compensation for changes (i.e., this Project), the Shellmouth Upgrade may no longer be the cost effective option

- The Lake is an excellent source of revenue (important for our local economy); tourism is huge in the area.
  - The high water mark from the flood of 1995 was used when we were building our resort on the Lake.
    - Will the high water mark on the Lake change?

- We need better monitoring and management, e.g., on the ground surveys; we had a lot of snow in 1995 that was not monitored in predicting the runoff.
  - We also need to have a better understanding of government management decisions.

- If the reservoir surface is higher, will they let more water out? There is already so much erosion on the shoreline of the Lake.
  - We live on the east side near the oxbow, two miles south of the dam; we have lost 10 ft. in the past 6 years; we haul hay on this road.
  - On the side with high bank, there are no trees.
  - The opposite side of the River has new willow tree growth.

- I am concerned about the compounding of issues.
  - What about cumulative effects.

- Since 1994, the bank in front of the lodge at Kilman resort lost a minimum of 6-10 ft of bank.
  - In 1995, the water was 1/4 of the way up to the Lodge.

- How many years before we have to move our cabins back?

- I am located on the East side of the Lake, south of PTH#5 (Ricker's Campground). We have shored up the banks with rocks; we want to do more to save shoreline. Is it worth doing now if the levels will change?
  - Others are also rip-rapping, at their own cost, and want this investment protected or compensated.

- If you raise the water, the banks would erode to the point of being on private property (i.e., behind the take line),
  - e.g., south of Ricker's campground.

- The Asessippi Provincial Park parking lot has flooded in the past and the fish huts were lost.
- In 1995, water covered most of our overflow camping sites, 12 seasonal sites, and it went 2 ft over the well (Pyott's West Campground).
  - At these levels, only a few seasonal sites in the bush would be okay.
  - An increase in high water line would flood these camp sites completely
  - If there were gates (resulting in water levels 6 ft lower than 1995 flood) we would still have some of these impacts.
- What about the bridge (on PTH#5)?
  - In 1995, boats couldn't pass under it.
- If surface water area is 6 ft higher than the 'normal level', what will happen every spring?
  - Every spring the surface water level on the Lake is 6-4 ft higher than it used to be in June-July.
  - If so, there will be bridges flooded, and property-damage problems.
- You can see the old roads under the reservoir through the ice in the winter and sometimes in the summer when levels are low (dry).
- What are the government's staff numbers available to monitor intake levels (i.e. expected spring freshet)?
- During dry years, with the needs for more water downstream, what will happen on the Lake?
- By raising the water level on the Dam, you are creating future demand downstream.
- Will other options be evaluated in concert with the Shellmouth Dam Upgrade?
  - Or, will you exhaust the potential of Shellmouth first?
- Why not build a project further south?
- I am concerned about the maintaining lake level (not about industry growth in Portage); would we not have a minimum water level for the lake (for recreation and ecology)?
- The Dam was built for flood control and downstream use; I don't think it should be used for promotion of irrigation.
- I think cottage owners should negotiate for a minimum drawdown of the reservoir.
- The government sold us lots for recreation and cottage development and now we are being told the Dam and reservoir are only for downstream flood control.
  - Which is it?
  - If it is both, we should all work together to try to meet both objectives.
- When we purchased our lot on Lake of Prairies, we got a brochure that said the summer target would be X but it has gone lower than that.

- Why do you draw down the Lake so early?
  - There is an issue of a lack of understanding as to why water is being released.
- Water quality – is it a consideration? Could there be provisions made to improve water (in July it's so green, with blue-green algae clumps because of the drainage coming in, and the agricultural runoff).
  - The River is a disgrace. Lives 4.5 miles downstream from Lazare.
  - This Project is a means to do riparian management.

APPENDIX L
Stakeholder Meeting No. 7
December 8, 2003 at 7:00 p.m.
Russell Open House
Issues Raised by the Participants

CANADA/MANITOBA SHELLMOUTH DAM
CONSOLIDATION AGREEMENT
PUBLIC OPEN HOUSE
HELD IN RUSSELL, MB
MONDAY, DECEMBER 8, 2003

- Historic commitments/predictions when Shellmouth Dam was built – what are they (e.g., what do the 1970 newspapers say)?

- It may make sense to look at additional storage on the Assiniboine downstream. In many years spring runoff is not captured at Shellmouth. Consider flows like those from the Qu'Appelle which enters downstream.

- Why are downstream users (e.g., irrigators) not paying for water on a unit cost basis to cover folks that may be damaged by water storage upstream?

- You need to recognize that Langenberg land drainage is contributing flow downstream of Shellmouth. You need to get this flow under control, perhaps with storage downstream of Shellmouth on the Assiniboine.

- Riverbanks downstream of PTH 16 are collapsing and widening every year at a fast rate. This may be due to high flow rates in summer releases from Shellmouth.

- You look after inflows south of the dam first, all the large drainages first, then discuss new gates at the Dam.

- How long did it take for the sport fishery (Walleye) to develop originally?
  - The upgrade will need to accommodate the historical migration rates of lake sturgeon and big mouth bass, i.e., by including some type of Fishway.

- Better moisture information will be required to manage the Dam, the new gates, etc. This is available as weather stations, soil testing and satellite technology advances. Farmer ditching in the watershed is ongoing and should be monitored and dealt with.

- We are no longer subjected to a "natural" flood, our land is now under water for 8 weeks; the floods are longer and later.

- In mid-March 1995, Manitoba Conservation told us that the Dam would hold the flood. I kept telling them there was a lot of snow but Manitoba Conservation said they could handle it – they had no idea the flood was coming.

- I'm on the Lake a lot and think it's operated poorly.

- The people on the Shellmouth Liaison Advisory Committee are not the right people – they aren't out on the Lake; we need more local representatives.

- SK drainage is coming in at approximately Binscarth and it affects dam operation.

- My personal point of view? Put a really high dam across the Assiniboine Valley where Highway #16 crosses the valley.

- Could use "of the shelf technology" to create a power generation possibility? To help the local municipality to gain more from the reservoir upgrade project?

- You could install small culverts and gates, on some of the creeks. You need to manage flooding and water supply on a watershed basis – e.g., if you are the person on the last 100 acres before the River, you need others controlling the flow of upstream drainage behind you and you need to control the rush to the River.

- There is not enough monitoring of inflow and not enough historical records. Flow from the tributary creeks should be controlled – e.g., even hold back one week; gates on private drainage (one week wouldn't usually make a difference to agriculture).

- There will be flooded beaches, docks, cabins, bridges, (e.g., the bridge on the Shell River, north of reservoir). Re: Dam structural safety (freeboard), will we be safe with this additional storage capacity)?
  - Erosion around the Lake creates an effect on my land downstream, and on fish habitat.

- Many people asked about "alternatives". What are they? Are they being considered? Alternatives are important.

- What about Dam safety? There is water trickling through near the culvert. If something goes wrong with the Dam, we will lose everything including the Dam. If we build an additional structure perhaps there will be less safety and economic risk. Doing an upgrade on the Shellmouth Dam is putting all our eggs in one basket.

- My land is next to the Lake, would it be flooded? My family farmed this area for 120 years. We also have ties to the local post office and I want to try and get a designated historical status for the building.

- The lowland areas in a 1950's aerial photograph shows drainage not a flood as stated in the 1995 in Upper Assiniboine Study. We have drainage issues (now increased and rapid land drainage). In the past there were sloughs to hold the water on the land (I think the aerial photographs of the Upper Assiniboine River Basin area looks like natural drainage sloughs, not a flood).

- I have approved sustenance-fishing rights (Aboriginal participant).
  - We used to be around St. Madelines, but we were forcibly moved. We can demonstrate traditional/genetic links to the area.
  - I believes there could be local tourism as a benefit, there are "no negatives"; I own a boat and fish in the lake, and have a shack on the lake,
    - Greater volume of water will create greater dissolved oxygen in the winter, creating improved habitat for fish;
    - I have observed lethargic fish in the winter.
    - We want to be involved in a constructive way; so our children and grandchildren can continue to fish.
    - Is there a possible management/construction role in the project for the Métis people?

- Would the Project limit future development (e.g., cottage, recreation)? I'm concerned that it could, especially if Dam operation includes large fluctuations in surface water elevations.

- I have concerns regarding minimum drawdown and suitable fish habitat.
  - During the Pembina Valley Hearings, Manitoba Conservation said they could draw down the lake to a slough; it's likely that won't happen now, with Department of Fisheries and Oceans.

- How will Dam operation change?
  - If gates are used as emergency back-up, it's great, an extra management tool.
  - If gates were used to keep water consistently higher, this would be a problem for us.
  - If there were a flood with the gates up it would be worse; the flood would happen later and we'd have more water to deal with.
  - the Dam creates "unnatural" floods – we used to get flooded but earlier, but when we were seeding, the land would be dry.
  - In some areas, the banks are naturally higher than the River, so when it floods the lowlands don't drain.
  - At 1,600 cfs, the river is full; you need to maintain between 800-1,000 cfs for land to be able to drain.
  - I am concerned about Dam operation and flooding; also the current uncertainty regarding compensation for flooding (i.e. at what point is money provided?).
  - I think compensation for the 1995 flood should be dealt with before any upgrade goes ahead.

- Regarding development on the Lake, we are finally getting some cottages, ski hill, camping etc.;
  - If the Lake is higher, it will destroy beaches;
  - This would create poor aesthetics – cutting away the shoreline (if surface water levels go up and down). It could become an unattractive place to build a cottage.
  - This is an operational issue – if the reservoir operation stays the same as it is now, we would likely be okay.

- When the Dam was first built, we lost River crossings (e.g. PTH#5); if the reservoir level will be higher, the bridge on the Shell River (old PTH83) could be lost.

- The timing of the flood can affect our choice of crop, e.g., some can be seeded later than others.

- You should put a series of small dams where the users need more water, e.g., at Holland, MB.
  - Build a dugout near Portage la Prairie for the potato plants
    - Dugouts could capture water released in the winter.
    - Water released from storage before we need it on the farm is wasted.
  - Shoreline clearing to the new level should happen.
  - What is the real need for more water?
  - We need better management of water in reservoir.
  - What will be the erosion impacts on shoreline and riverbanks after raising the reservoir water levels?
  - We want the history from current dam monitoring of erosion impacts.

  - Drainage needs to be quantified and need the number of acre-feet coming into dam and downstream.
  - Re: 1995 damage to river; fences were lost, and debris and silt in Smith Creek in the RM of Russell happened; it was also washed out in 1999 and 2003. Then there's weed growth. 25% capacity has been lost in the Assiniboine River.

- The Auditor General needs to investigate disaster assistance in 1995.
  - In 1995, maximum compensation was $30,000.
  - We need a compensation mechanism for farmers in Russell.
  - The capacity of dam is not adequate.
  - Need to be able to avoid a deeper flood for 10 more days.
  - Re: additional drainage; do pesticides flow with runoff and cause changes in the reservoir? If so, what are the impacts?

- What would be the benefit to the area near Russell?
  - Fisheries production could increase in the reservoir; we want to reduce winter fish kills.

- When the Dam was built, we were told it would take seven years to fill the dam but it only took one year.
  - When the Dam was built, the options were to sell our land cheaply or risk flooding.
  - Can we have access to the presentation given today (the storyboards and the power point presentation)?

- Why is water needed downstream?
  - Can businesses be more efficient downstream?
  - Should downstream users pay for more water supply?
  - Should upstream mitigation costs be paid by downstream users?
  - What about erosion of riverbanks? Banks are falling into the river.
  - What about soil and silt buildup in the river?
  - The Dam has changed the river into a canal.
  - The water processes in the river have been reversed; when levels were historically low, they are now currently high.
  - Someone needs to see the effect of riverbanks falling into river.

- In 1995, no one came to see what happened to us (the landowners downstream of the Dam). We received no compensation.
  - In 1995, we were under water for 8 weeks; it took 3 years for weeds to stop growing in those wet areas.
    - In 1995, Hwy 83 was flooded; if water levels are raised, then Hwy 83 must be raised.

- I would like to know the river elevation at the Millwood Bridge
  - What is the river elevation and land elevation at the Binscarth Bridge? I think there has been a decrease.
  - Further downstream on the Assiniboine River would have provided better flood control and a better location for a new Dam.

- Since 1995, the RM of Russell has spent lots of money repairing creeks and river.
  - We need to know how many acre-feet of land has been eliminated (from erosion).
  - We need to know pothole-drainage effects.

  - Something needs to be put in place also for downstream flood control (e.g. another structure, weirs on tributaries, etc.). We need to ensure that if we are damaged that we will be compensated.
  - The 1995 flood caused one farmer $280,000 in direct and indirect costs, with only $26,000 in compensation.
  - In 1995, we experienced seeding delays, and produced no hay.

- Many people have drained their lands - do they have a legal permit to do so?

APPENDIX M
Stakeholder Meeting No. 8
December 10, 2003 at 9:00 a.m.
Winnipeg
Issues Raised by the Participants

MEETING NO. 8
MANITOBA CONSERVATION
BOARDROOM A, 200 SAULTEAUX CRESCENT
WINNIPEG, MB
WEDNESDAY DECEMBER 10, 2003
9:00 A.M. TO 12:00 NOON

- Hopefully this process will give priority consideration to water regimes and water quality issues that are conducive to present and future tourism and recreational development in and around Lake of the Prairies.

- Will increased storage increase the duration of the downstream discharge?

- What is the relationship of the upgrade to the Floodway Expansion?

- Discussed relationship with irrigation and the related pressure to increase security of flow.
  - Noted that demands will make for a difficult balancing act.

- Discussion of Shellmouth operations;
  - How many times has the spillway been used?
  - Why was the gate closed in the conduit in 1995?

- Discussion about the First Nation groups and interests.
  - These need to be addressed in the EIA; glad there is a separate and ongoing process for Aboriginal peoples.

- Noted historic First Nation observations of "hairy horses with long noses". Discussed shoreline recession and noted that six historic sites on west side of the reservoir were found (going back 6,000 years) of low water level. Noted that shoreline erosion will increase loss of historic sites.

- You need to assess shoreline during drawdown to ascertain the historic sites that could be lost.
  - Discussed relation to northern flood projects.
  - Glad to hear issue was on the list. Important to many area First Nations.

- Discussion of issue of higher water reservoir and who was raising this as an issue.

- Impacts on downstream water quality, as well as quantity need to be addressed.
  - Issue of nutrient loading to Lake Winnipeg, and the utilization of assimilative capacity, requires attention.

- Noted that the baseline is on "shifting sands" and that the issue of cumulative impacts will be challenging.
  - Noted need to understand all related environment "spin off" effects.
  - Discussed timelines for the assessment process "seem ambitious".

- Noted that $120,000 (1999) put into Kilman Resorts Cottage Development. Noted that Lake of the Prairies is the 4th best Walleye fishery in prairies.
  - Discussed issues of tourism development on the reservoir and the promises made.

- There could be a potential shift in species composition in the reservoir.

- Critical Walleye/Northern Pike should be protected to ensure resident and American fisheries.
    - The project needs to maintain the species most attractive to the recreational market.

- Protection of high quality gravel deposits (and potential compensation issues) is important to local RMs.
    - There are potential issues from any future Potash Mine; a large salt pile could have an effect on the drainage to the reservoir.
    - Unlikely to proceed in short term.

- The scoping and EIA teams must go to individual First Nation communities directly, as opposed to going through Tribal Councils.
    - "while you should contact Tribal Councils, you still need to meet with individual communities'.
    - You must go through Chief and Council to ensure that you are going through the right people.
    - Métis communities should also be contacted.

- Traditional Use Areas (Aboriginal) must be addressed carefully.
    - it is good that we are discussing traditional use areas up front.

- If PFRA approaches First Nations, you must follow up. It is very important to follow-up.

- It is important to ensure that there are additional s.35 "consultations" and liaison beyond this particular process.

- What is Saskatchewan's interest in this scoping study?
    - Bruce Webb – expected that there would be interest.
    - Tony Kettler – asked if Manitoba Conservation or federal would be interested in participating with discussions.

- Has the CEAA (Dan McNaughton) stated a position in regard to the SK/MB discussions about jurisdictional requirements?
    - Bruce Webb – noted that he just facilitated.

- The main issue for the City of Winnipeg would be minimum flow to be maintained at Headingley.
    - Discussed other increasing withdrawals, which may increase extremes in high and low downstream water levels at communities needing consistent assimilative capacity.
    - Noted that City had allocated assimilative capacity at WEWPCC and NEWPCC (wastewater treatment plants in Winnipeg) that can't be put at any risk because of the upgrade.

- From the City of Winnipeg's perspective, flows are generally more important (to the City's concern for adequate assimilation capacity than water quality.
    - Nick Szoke discussed the basis for the 200 cfs limit at City of Winnipeg.

- What flows are needed at Portage la Prairie vs. river assimilation capacity needs at Winnipeg?

- What Assiniboine River flows are needed to maintain the City of Winnipeg urban fishery?
  - City of Winnipeg tourism, e.g., the Forks.

- There are various irrigation issues that relate to the upgrade;
  - agriculture is looking to diversify and additional water supply offers that opportunity.

- When can flow information be shared?

APPENDIX N
Stakeholder Meeting No. 9
December 10, 2003 at 7:00 p.m.
Winnipeg
Issues Raised by the Participants

MEETING NO. 9
WINNIPEG CONVENTION CENTRE
375 YORK AVENUE
WINNIPEG, MB
WEDNESDAY, DECEMBER 10, 2003
7:00 P.M. TO 10:00 P.M.

- Industries want to take water from the river because it is easiest; what about off-stream storage, capturing spring runoff (i.e., in lieu of the irrigation)?
- We have to look at alternatives; especially if the goal is primarily water provision.
- I am concerned about the potential export of our water.
- How much water is Saskatchewan using of their 50% allocation of the Assiniboine River water (prior to entering Manitoba)?
- There must be a consideration of climate change. The climate change model created by Alf Warkington should be used. The CWRA website would also be useful.
- Industry and municipalities charge for water use; they will benefit while others pay for it.
- I think equity should be an issue; the main downstream beneficiaries of an upgrade are a select few industries (e.g., potato farmers).
- From the environmental assessment perspective, there is a need to include many alternatives. The irrigation groups should be included in this discussion.
- Is water conservation being considered as part of the planning/alternatives?
- If there is a website created to house the information on this Project and the public issues, it would be a good idea to advertise its existence in the newspapers.
- This is a positive process; it seems like issues are being raised or would be looked into before the project would go ahead.
- The invitation letter didn't make clear that all of the meetings were the same (i.e., provided the same information).
- There should be public access to the scoping report that comes out of these meetings and the issues that were raised. This would be useful for people who weren't here, they could see if others had raised their issues.
- Access to this information (e.g. on a website) would be a good tool for us as an umbrella organization (cottagers). Such a website would also serve as an archive.

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APPENDIX O
Stakeholder Meeting No. 10
December 15, 2003 at 1:30 p.m.
Portage la Prairie
Issues Raised by the Participants

MEETING NO. 10
CANAD INN – 2401 SASKATCHEWAN AVE.
PORTAGE LA PRAIRIE, MB
MONDAY, DECEMBER 15, 2003
1:30 P.M. – 5:00 P.M.

- Regarding the upgrade (the potential for gates) – will there be any carry over from past, i.e., problems from outstanding issues?
  - i.e., will you also look at issues that remain from the initial dam project?
  - People here don't understand the impacts that people are experiencing just downstream of the Dam.

- Does the existing agreement with SK farmers consider higher levels in the Lake?

- I can't imagine that government didn't sign a compensation agreement with the downstream farmers as they did with the upstream farmers.
  - We want good, clean water but we don't want people upstream of us (Portage and Brandon) to be harmed; we want people who experience any negative effects to be compensated.

- 15-20 miles below the Dam is the area where it is hard to control water levels; to control water on the land. This is where the River can't handle the water released (e.g., release much more than River can hold).
  - I believe we should buy the downstream land to Highway 16 and lease it back; just as was done with the Kamsack farmers.
  - What are the comments from the Department of Fisheries and Oceans?

- Regarding bridges – what would the impacts be? Would some bridges be moved? Has there been a cost analysis done of this and all the indirect mitigation required?

- We (landowners downstream of the Dam) don't (necessarily) want to be moved off the land; we aren't looking for a blank cheque but we need help.
  - On years when income is affected, we need something to help us out.

- There are farms near Holland that in 1976/79 couldn't be growing much; they were too wet; some areas are no longer cultivated, are now only in hay.
  - After the Dam, some people felt a false sense of security and started cultivating land (that was near the River, in the valley) in cereal crops versus growing hay/grass.
  - Landowners downstream of the Dam feel like we were left out in 1995; unlike for the Red River Valley:
    - no income-loss compensation;
    - no stress line, no social assistances (e.g., paid access to counsellors or social workers).

- There needs to be provincial standards for how all people would be treated during flood events – a standard for when compensation would be provided (i.e., uniform eligibility).

- Most people didn't have crop insurance (since normally it wouldn't be worth it) in the past; also the inability to seed wasn't a common component of insurance in the past (now it is).

  - Land was bought up and leased back for construction of the Portage Diversion; this has been successful, I haven't heard any complaints.
  - Allocation of $100,000 for downstream studies is not sufficient – given that the Dam has two goals (downstream water supply and flood control) and that there is a large area involved (environmental issues); is this enough money?
  - Is this money intended for the study of downstream impacts?
  - Could there be other options – alternatives to upgrading the Shellmouth Dam? (e.g., water storage similar to Crescent Lake in Portage).

- What are the alternative storage options? We were asked to look at oxbows and other storage capacity around Portage/Brandon for another study. Will this feed into your process? (e.g., oxbows are already there, using these for storage would result in fewer environmental concerns).
  - Will you be working with Conservation Districts along the Assiniboine River?
  - I think a web page would be a great idea for sharing the information gathered during this process (and in the future).
  - Should be studying on a broader basis; we need to include focus on the flows coming from the aquifers.
  - We need a draft management plan for the entire Assiniboine Delta Aquifer.

- Regarding cottage owners on the Lake of the Prairies - are there regulations as to where they can build?

- Regarding the potential for gates on the Dam, this would help with flood control and downstream water needs now and in the future. There are a lot of economic benefits to more water for Manitoba.
  - Oxbows could also be used but are more for secondary storage.
  - Will increased surface water elevations have an effect (increase or decrease) on the algae in the reservoir?
  - We are concerned about water quality in the river given that the city of Portage la Prairie (and Brandon) depend on this water.

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APPENDIX P
Supporting Documents for Environmental Setting

TABLE P-1

FISH SPECIES POTENTIALLY OCCURRING WITHIN THE ASSINIBOINE RIVER BASIN ACCORDING TO WATERBODY

SCIENTIFIC NAME	COMMON NAME	ASSINIBOINE RIVER	SOURIS RIVER	QU'APPELLE RIVER	WHITESAND RIVER	SHELL RIVER	LILIAN RIVER	YORKTON CREEK	GOOD SPIRIT LAKE	FISHING LAKE	YORK LAKE	ROUSSAY LAKE	LEECH LAKE	[illegible] LAKE	[illegible]
Salvelinus alpinus	Arctic char														
Ictiobus cyprinellus	Bigmouth buffalo	Y		Y											
Notropis dorsalis	Bigmouth shiner	Y	Y			Y									
Ameiurus melas	Black bullhead	Y	Y												
Pomoxis nigromaculatus	Black crappie														
Notropis heterodon	Blackchin shiner	Y	Y												
Rhinichthys atratulus	Blacknose dace	Y	Y	Y	Y	Y									
Notropis heterolepis	Blacknose shiner	Y	Y												
Percinamaculata	Blackside darter	Y	Y	Y	Y	Y									
Lepomis macrochirus	Bluegill														
Hybognathus hankinsoni	Brassy minnow	Y													
Culaea inconstans	Brook stickleback	Y	Y	Y	Y	Y		Y							Y
Salvelinue fontinalis	Brook Trout	Y	ex			Y									Y
Ameiurus nebulosus	Brown bullhead	Y	Y	Y	Y										
Salmo trutta	Brown Trout					Y									
Lota lota	Burbot	Y	Y			Y									Y
Cyprinus carpio	Carp	Y	Y	Y		Y			Y						Y
Umbra limi	Central mudminnow	Y	Y												
Ictaluruspunctatus	Channel catfish	Y													
Ichthyomyzon	Chestnut lamprey	Y	Y	Y	Y										Y
Coregonus artedii	Cisco	Y													
Luxilus cornutus	Common shiner	Y	Y	Y	Y	Y									
Semotilus atronaculatus	Creek chub	Y	Y			Y									Y
Notropis atherinoides	Emerald shiner	Y	Y	Y	Y										Y
Pimrphales promelas	Fathead minnow	Y	Y	Y	Y			Y							Y
Phoxinus neogaeus	Finscale dace	Y													
Plalygobio gracillis	Flathead chub	Y	Y			Y									
Aplodinotusgrunniens	Freshwater drum	Y	Y												
Moxostoma reytrurum	Golden redhorse	Y													
Notemigomus chrysoleucas	Golden shiner	Y													
Hiodon alsoides	Goldeye	Y	Y												
Carassius auratus	Goldfish	Y													
Etheostoma exile	Iowa darter	Y	Y	Y	Y										Y
Etheostoma nigrum	Johnny darter	Y	Y	Y	Y	Y									Y
Couesius plumbeus	Lake chub		Y												
Acipenser fluvescens	Lake sturgeon	Y													
Salvelinus namaycush	Lake trout	Y													
Coregonus clupeaformis	Lake whitefish	Y	Y												
Micropterus salmoides	Largemouth bass	Y													
Perina caprodes	Logperch														
Rhinichthys cataractae	Longnose dace	Y	Y			Y									
Catostomus catostomus	Longnose sucker		Y												
Hiodon tergisus	Mooneye	Y	Y												Y

Table P-1 (Con't)

SCIENTIFIC NAME	COMMON NAME	ASSINIBOINE RIVER	SOURIS RIVER	QU'APPELLE RIVER	WHITESAND RIVER	SHELL RIVER	LILIAN RIVER	YORKTON CREEK	GOOD SPIRIT LAKE	FISHING LAKE	YORK LAKE	ROUSSAY LAKE	[illegible] LAKE	[illegible] LAKE	LAKE OF THE PRAIRIES
Esox masquinongy	Muskellunge	Y													Y
Pungitius pungitius	Nine spine stickleback		Y	Y	Y										
Esox lucius	Northern pike	Y	Y	Y	Y	Y			Y	Y	Y				Y
Chrosomus eos	Northern redbelly dace	Y	Y												
Semotilus margarita	Pearl dace	Y	Y	Y	Y										
Carpiodes cyprinus	Quillback	Y				Y									
Oncorhynchus mykiss	Rainbow trout	Y	ex			Y									
Percina shumardi	River darter	Y													
Notropis blennius	River shiner	Y	Y												
Ambloplites rupstris	Rock bass	Y	Y			Y									Y
Notropis stramineus	Sand shiner	Y	Y	Y											
Stizostedion canadense	Sauger	Y	Y	Y											Y
Moxostoma macrolepidotum	Shorthead redhorse	Y	Y			Y									Y
Macrhybopsis storeriana	Silver chub	Y													
Ichthyomyzon unicuspis	Silver lamprey	Y													
Moxostoma anisurum	Silver redhorse	Y	Y			Y									Y
Cottus cognatus	Slimy sculpin	Y	Y												
Micropterus dolomieui	Smallmouth bass		Y												Y
Cypinella spilpotera	Spotfin shiner	Y													
Notropis hudsonius	Spottail shiner		Y	Y					Y						Y
Noturus flavus	Stonecat	Y	Y												
Noturus gyrinnus	Tadpole madtom	Y	Y												
Peropsis omiscomayus	Trout-perch	Y	Y			Y			Y						
Stizostedion vitreum	Walleye	Y	Y	Y	Y	Y			Y	Y			ex		Y
Morone chrysops	White bass														
Catostomus commersoni	White sucker	Y	Y	Y	Y	Y			Y	Y	Y				Y
Perca flavescens	Yellow perch	Y	Y	Y	Y	Y			Y	Y	Y				Y
Notropis spp.	Shiners*									Y					
	Sticklebacks*														
	Total Numebr of Species Present	**59**	**45**	**21**	**16**	**23**	**0**	**2**	**7**	**5**	**3**	**0**	**0**	**0**	**22**

Source: Manitoba Conservation 2003a, Murphy 3002, and Stewart & Watkinson 2003

Note:
* Individual species within group was not completely identified
ex - extirpated

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TABLE P-2

FOOD SOURCES OF FISH SPECIES KNOWN OR EXPECTED TO RESIDE IN THE RED RIVER AND ASSINIBOINE RIVERS

			STATUS		FOOD SOURCES		
SCIENTIFIC NAME	COMMON NAME	LIFE SPAN	KWS[1]	MC[2]	LARVAL	JUVENILE	ADULT
Ichthyomyzon castanaeus	Chestnut lamprey	18 mo	N	U	filter-feeding, minute invertebrates		fish (parasitic)
Ichthyomyzon unicuspis	Silver lamprey	12-20 mo	N	U	filter feeding, microscopic orgs		fish (parasitic)
Acipenser fluvescens	Lake sturgeon		N, R		yolk sac, 9 - 18 days		insect larvae, invertabrates, fish (rarely)
Hiodon alsoides	Goldeye		N	C			insects, invertabrates
Hiodon tergisus	Mooneye		N	R			insects, invertabrates, small fish
Carassius auratus	Goldfish		I				larvae, insects, invertebrates, crustaceans, vegetation
Couesius plumbeus	Lake chub		O	U			terrestrial & aquatic insects, zooplankton, algae, small fish
Cypinella spiloptera	Spotfin shiner	up to 3 years	N, Pembina R				insects and emerging inset larvae, plankton, small fish eggs, drifting fish eggs (Wisconsin)
Cyprinus carpio	Carp	9 - 15 years	I	C		small crustaceans	insects, invertebrates, vegetation
Hybognathus hankinsoni	Brassy Minnow		N, Pembina R	U			phytoplanton, other algae, zooplankton, & some aquatic insects
Luxilus comutus	Common shiner	4 years (Michigan)	N, Trib	U			filamentous algae, a variety of aquatic invertebrates, adult insects, small fish
Macrhybopsis storeriana	Silver chub*	3 years	N	C		invertebrates, aquatic insects	benthic aquatic insect larvae, emerging mayflies
Margariscus margarita	Pearl dace	3 years		U			insect larvae, terrestrial insects
Nocomis biguttatus	Homyhead Chub	4 years (Wisconsin)	1 record reported in Red River	U		benthic aquatic invertabrates	filamentous algae, aquatic invertabrates
Notemigomus chrysoleucas	Golden shiner	up to 5 years[3]	N, R	U			variety of planktonic invertabrates; plant material
Notropis atherinoides	Emerald shiner	3 years	N	A			plankton, acuatic insects
Notropis blennius	River shiner		N	U			
Notropis dorsalis	Bigmouth shiner	2 years (Wisconsin)[4]	N, Roseau & Pembina R's	U			insect larvae, filamentous algae
Notrpois heterodon	Blackchin shiner			U			small crustaceans and small insects
Notropis heterolepis	Blacknose shiner			U			cladocera, insects and green algae
Notropis hudsonius	Spottail shiner			C			plankton, invertebrates, insects

			STATUS		FOOD SOURCES		
SCIENTIFIC NAME	COMMON NAME	LIFE SPAN	KWS[1]	MC[2]	LARVAL	JUVENILE	ADULT
Notropis rubellus	Rosyface shiner			U			aquatic & terrestrial insect
Notropis stramineus	Sand shiner	3 year (Wisconsin)[4]	N	U			organic detritus, diatoms, algae, larval and adult insects[6]
Notropis volucellus	Mimic shiner	2 years		U			aquatic invertabrates, blue-green algae
Phoxinus eos	Northern redbelly dace		N, Trib				algae, vegetation, insects
Chrosomus neogaeus	Finescale dace		N, Rat R				insects, plankton, crustaceans
Pimephales notatus	Bluntnose minnow		N, Rat R	U			
Pimephales promelas	Fathead minnow[6]	2 years (Wisconsin)[4]	N	C			algae, vegetation, insects
Platygobio gracilis	Flathead chub		N	U			insects, fish
Rhinichthys atratulus	Blacknose dace	up to 5 years	N, lower	U			insects
Rhinichthys	Longnose dace	maximum 5 years (Wisconsin)	N	U	yolk sac, 7 days		aquatic iinsects (almost to exclusion of all others)
Semotilus atronaculatus	Creek chub	7 years	N	U			plankton, vegetation, insects, invertebrates, fish
Carpiodes cyprinus	Quillback		N, 1 record	U			invertebrates, organic material in sediments
Catostomus catostomus	Longnose Sucker		N	C	yolk sac, 1-2 weeks		invertebrates, algae, organic matter in sediments, bottom feeder
Catostomus commersoni	White sucker		N	C		surface plankton, small invertebrates	benthic invertebrates, insects
Ictiobus cyprinellus	Bigmouth buffalo			U			plankton, invertebrates
Moxostoma anisurum	Silver redhorse		N	C			invertebrates, insects, algae
Moxostoma erytrurum	Golden redhorse		N	R			invertebrates
Moxostoma macrolepidotum	Shorthead redhorse	12 -14 years	N	C			invertebrates, insects, algae
Ameiurus melas	Black bullhead	maximum 5 years (Wisconsin)[4]	N	C	yolk sac	immature invertebrates	snails, leeches, crayfish, tadpoles of frogs, carrion of fish
Ameiurus nebulosus	Brown bullhead	maximum 5 years (Wisconsin)[4]	N	C	yolk sac, 7 days	immature invertebrates	snails, leeches, crayfish, tadpoles of frogs, carrion of fish
Ictalurus punctatus	Channel catfish[6]	up to 27 years	N	C	yolk sac, 2-5 days	benthic aquatic invertabrates, crayfish, aquatic insects, freshwater mussels	invertebrates, fish, vegetation
Noturus flavus	Stonecat[6]		N	U			nocturnal feeder; aquatic insects, amphipod crustaceans

[8] - KWS = Stewart and

[9] - MC = Manitoba

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TABLE P-3

SPAWNING CONDITIONS OF FISH SPECIES KNOWN OR EXPECTED TO RESIDE IN THE RED RIVER AND ASSINIBOINE RIVERS

			STATUS[7]		MATURITY		SPAWNING				
SCIENTIFIC NAME	**COMMON NAME**	**LIFE SPAN**	**KWS**	**MC**	**MALE**	**FEMALE**	**TIME OF YEAR**	**TEMP (°C)**	**EGGS**	**NUMBER OF EGGS**	**HATCHING TIME**
Ichthyomyzon castanaeus	Chestnut lamprey	18 mo	N	U			early - mid June but as late as Jul	12 - 13	nests	24,000 - 107,000	unclear
Ichthyomyzon unicuspis	Silver lamprey	12-20 mo	N	U					nests	10,800	few weeks
Acipenser fluvescens	Lake sturgeon		N, R				early May - late Jun	13 - 18	adhesive eggs scattered, adhere to rocks	107,000 - 885,000	5 - 8
Hiodon alsoides	Goldeye		N	C	6 - 9 years	7 - 10 years	May - early Jul	10 - 12.8	semibouyant		2 weeks
Hiodon tergisus	Mooneye		N	R			Mar - May				
Carassius auratus	Goldfish		I				May to Jun		adhesive eggs deposited over aquatic plants		3 days + dependant on temp
Couesius plumbeus	Lake chub		O	U			late May - early Jun	14 - 19		500	
Cypinella spiloptera	Spotfin shiner	up to 3 years	N, Pembina R				late May - early Sept[4]		adhesive; female spawn repeated over summer; laid on submerged logs, roots, crevices among boulders, etc.; male defends territory	200-1500	
Cyprinus carpio	Carp	9 - 15 years	I	C	4 - 5 years	3 - 4 years	late Apr - Jun	17	adhesive, deposited randomly to adhere submerged weeds, grasses, roots	100,000 - 500,000	3 - 6 days
Hybognathus hankinsoni	Brassy Minnow		N, Pembina R	U	2 years	2 years	May - Jun		eggs deposited in quiet water over silt bottom; adhesive eggs deposited over sand, weed, or debris		
Luxilus comutus	Common shiner	4 years (Michigan)	N, Trib	U			May - Jul in Wisconscin[4]	15.6 - 18.3	nests with adhesive eggs	50	
Macrhybopsis storeriana	Silver chub*	3 years	N	C	3 years	3 years	Jun - Jul in Wisconscin[4]	> 21	unknown	2,600-11,500	unknown
Margariscus margarita	Pearl dace	3 years		U	3 years	3 years	late Apr	16	released over subtrate ranging from gravel to silt; no nest		

			STATUS[7]		MATURITY		SPAWNING				
SCIENTIFIC NAME	**COMMON NAME**	**LIFE SPAN**	**KWS**	**MC**	**MALE**	**FEMALE**	**TIME OF YEAR**	**TEMP (°C)**	**EGGS**	**NUMBER OF EGGS**	**HATCHING TIME**
Nocomis biguttatus	Hornyhead Chub	4 years (Wisconsin)	1 record reported in Red River	U			May in Ontario and as late as July in Wisconscin [4]; probably protracted in Manitoba	23.9	adhesive eggs are released and settle amoung gravel nest, male continues to add more stones to nest; more than 1 female deposits eggs at each nest; nest expanded as	460 - 725	
Notemigomus chrysoleucas	Golden shiner	up to 5 years[3]	N, R	U			not studied in Manitoba[2]; mid-late Jun - Aug	20	eggs broadcast over submerged filamentous vegetation		
Notropis atherinoides	Emerald shiner	3 years	N	A			late Jun - early Jul	> 20			24-32 hours
Notropis blennius	River shiner		N	U			throughout summer to late				
Notropis dorsalis	Bigmouth shiner	2 years (Wisconsin)[4]	N, Roseau & Pembina R's	U			late May - early Aug[4]		eggs drifting downstream		
Notrpois heterodon	Blackchin shiner			U			May - Jun				
Notropis heterolepis	Blacknose shiner			U			spring - summer				
Notropis hudsonius	Spottail shiner			C			Jun - Jul			100-2600	
Notropis rubellus	Rosyface shiner			U			Jun	26 - 29	groups of 8-12 shiners release eggs & sperm over depressions in gravel &/or shallow riffles	400 - 1480	57 - 59 hours
Notropis stramineus	Sand shiner	3 year (Wisconsin)[4]	N	U			mid Jun - mid July[4]		scattered over clean gravel	250-1800	
Notropis volucellus	Mimic shiner	2 years		U			Jun - Jul		eggs broadcast over aquatic vegetation at depths of 15-20 feet	367	
Phoxinus eos	Northern redbelly dace		N, Trib		2 years	2 years	spring/early summer to August	21.1 - 26.7	eggs non-adhesive within masses of filimental algae; may spawn twice in a season	435	8 - 10 days
Chrosomus neogaeus	Finescale dace		N, Rat R				Apr - Jun			820 - 1600	
Pimephales notatus	Bluntnose minnow		N, Rat R	U			May - Aug			200 - 500	
Pimephales promelas	Fathead minnow[6]	2 years (Wisconsin)[4]	N	C	1st Summer[4]	1st Summer[4]	mid May - late Jun	16 - 18	nest with large masses of bouyant, adhesive eggs that aqdhere to the roof of nest cavity		
Plalygobio gracillis	Flathead chub		N	U			Spring[4]		nests		
Rhinichthys atratulus	Blacknose dace	up to 5 years	N, lower	U	2 years	2 years	May - Jun	21	released on spawning grounds; no nest; established territory		

			STATUS[7]		MATURITY		SPAWNING				
SCIENTIFIC NAME	COMMON NAME	LIFE SPAN	KWS	MC	MALE	FEMALE	TIME OF YEAR	TEMP (°C)	EGGS	NUMBER OF EGGS	HATCHING TIME
Rhinichthys	Longnose dace	maximum 5 years (Wisconsin)	N	U			late April - early Jun (Wisconscin)[4]	16	adhesive eggs deposited oin groups in crevices between stones on gravel substrate; no nest with established territory	200-1200	7-10 days
Semotilus atronaculatus	Creek chub	7 years	N	U	4 years	3 years	May - early Jun	≥ 13	trench 10-12" wide and many feet long		
Carpiodes cyprinus	Quillback		N, 1 record	U			Apr - May		eggs deposited over sand/mud bottom; no nest		
Catostomus catostomus	Longnose Sucker		N	C	5 - 7 yrs	5 - 7 yrs	mid- April - mid-May	> 5	white, adhesive, demersal; ahdhere to gravel and	17,000-60,000	8-14 days
Catostomus commersoni	White sucker		N	C	5 - 8 years	5 - 8 years	early May - early Jun	10 - 15	adhesive; scattered to adhere to gravel or drift downstream to adhere to substrate in quiet	20,000-50,000	8-11 days
Ictiobus cyprinellus	Bigmouth buffalo			U	~ 9 yrs	~ 12 years	mid May - early Jun	15 - 18	adhesive; scattered to adhere to vegetation	750,000	2 weeks
Moxostoma anisurum	Silver redhorse		N	C	~5 years	~ 5 years	Jun	13		14,000 - 36,000	
Moxostoma erytrurum	Golden redhorse		N	R		4 years	mid-May	15	eggs scattered and abandoned	6,100 - 25,000	
Moxostoma macrolepidotum	Shorthead redhorse	12 -14 years	N	C	3 - 5 years	5 - 5 years	May - Jun	11	eggs scattered and abandoned	13,000-27,000	
Ameiurus melas	Black bullhead	maximum 5 years (Wisconsin)[4]	N	C			mid - late Jun[4]	21	female excavates nest, mates with a single male, guards and fans the nest, nests encased in gelatinous coat, herd young into dense school and accompany young after yolk-	3,000-4,000	5 days, temperature dependant
Ameiurus nebulosus	Brown bullhead	maximum 5 years (Wisconsin)[4]	N	C	3 years	3 years	May - Jun	21	female excavates nest, mates with a single male, guards and fans the nest, nests encased in gelatinous coat, herd young into dense school and accompany young after yolk-	2,000 - 13,000	6-9 days; temp dependant
Ictalurus punctatus	Channel catfish[6]	up to 27 years	N	C	10 years	10 years	late Jun - Jul	21 +	nest excavated under cover or in a cavaity, male pairs with female and spawn repeatedly until spent, male cleans and fans eggs until hatch (indication that spawning may	4,000-34,000	5-10 days; temperature dependant
Noturus flavus	Stonecat[6]		N	U			Jun - Jul	28	male excavates nest and tend after spawning	700-1,200	

			STATUS[7]		MATURITY		SPAWNING				
SCIENTIFIC NAME	**COMMON NAME**	**LIFE SPAN**	**KWS**	**MC**	**MALE**	**FEMALE**	**TIME OF YEAR**	**TEMP (°C)**	**EGGS**	**NUMBER OF EGGS**	**HATCHING TIME**
Noturus gyrinnus	Tadpole madtom[6]	2 -3 years	N	C	2 years	2 years	late Jun - Jul (Wisconsin)[4]		egg clusters in gelatinous envelope; nests under cover, male guards nest, female may spawn several times	50-90	
Esox lucius	Northern pike	10-12 years	N	C	2 - 3 years	3 - 4 years	Apr - early May	5 - 11	adhesive eggs scattered randomly, adhere to vegetation	32,000	12 - 14 days - (increased tem 4 - 5 days @ 17-20°C)
Umbra limi	Central mudminnow	8 to 9 years	N	C	1 year	2 years	Apr	13	individual adhesive eggs deposited directly on to vegetation	220 - 2200	6 days
Osmerus mordax	Rainbow smelt		N				shortly after ice break-up (Great Lakes)[4]	4.5 - 15	adhesive eggs sink to the bottom after spawn	31,338	20 - 30 days @ 5-10 degrees; 10 days @ 15 degrees
Coregonus artedii	Cisco	upto 13 years	I lower, 1 record	C	2 - 4 years	2 - 4 years	during times of declining water temperatures in fall, usually a week or 2 following Lake Whitefish	3.3 - 5	eggs deposited and abandoned by adults	6,000 - 29,000	92 - 106 depending on water temperature
Coregonus clupeaformis	Lake whitefish		N	UC			Sep - Oct	~ 8	deposited randomly over spawning grounds	~ 10,000 variable by location	Apr - May
Thymallus arcticus	Artic graylling	11 - 12 years	I, Fort Whyte Centre		6 - 9 years	6 - 9 years	April - Jun when ice breaks	7 - 10	no nest or redd prepared; eggs are released and somewhat covered by material stirred up during vibration of spawning	4,000 - 15,905	13 to 18 days
Oncorhynchus mykiss	Rainbow trout	5-9 years	I		3 - 4 years	3 - 4 years	mid-Apr - late Jun	10 - 15.5	redds in fine gravel	800-1000	4 to 7 weeks
Salmo trutta	Brown trout		I				Spring			400 - 2000+	
Salvelinus alpinus	Arctic char		I, escapees		6 - 9 years	6 - 9 years	Sep - Dec (temp dependant)	4	redds	3000-5000	4 to 8 months
Salvelinus fontinalis	Brook trout		I, William Lake				Fall		redds	100 - 1200 (average 300-400)	47 days @ 10 degrees; 165 days @ 2.8 degrees
Peropsis omiscomayus	Trout-perch	~ 4 years	N	C	~1 year	~1 year	May			200 - 700	20 days
Lota lota	Burbot		I	C	3 - 4 years	3 - 4 years	Nov - May	0.5 - 2.0	under ice		30 days
Fundulus diaphanus	Banded Killfish			U							

			STATUS[7]		MATURITY		SPAWNING				
SCIENTIFIC NAME	**COMMON NAME**	**LIFE SPAN**	**KWS**	**MC**	**MALE**	**FEMALE**	**TIME OF YEAR**	**TEMP (°C)**	**EGGS**	**NUMBER OF EGGS**	**HATCHING TIME**
Culaea inconstans	Brook stickleback[6]	up to 2 years	N	C	1 year	1 year	Jun	8 - 19	hollow, spherical nest with single opening made of organic detrius and filamentious vegetation anchored on vegetation or just above, female enters nest to deposit eggs and male fertilizes, several females deposit, male cleans and ventilates eggs, male remains		
Pungitius pungitius	Ninespine			C							
Morone chrysops	White bass	4 years (Mississippi River)	I, La Salle River	C	3 years	3 years	early - mid Jun	14 - 21	adhesive eggs released near surface or mid-water, sink and attach to grave, boulders, or vegetation	200,000 - 900,000	~ 46 hours
Ambloplites rupestris	Rock bass			C			Jun	16 -21	shallow, 2' diametre nests; adhesive eggs	3,000 - 11,000	3 - 4 days (@ 20 - 21°)
Lepomis gibbosus	Pumpkinseed		N								
Lepomis macrochirus	Bluegill	8 - 10 years	N, R		2 - 3 years	3 - 4 years	early - mid summer in	10	nest excavated, eggs adhesive	7,200 - 38,000	3 - 5 days
Micropterus salmoides	Largemouth bass	15 years (Southern Ontario)[4]	I, Lake Minnewasta, Fort Whyte				early Jun - August	16 - 18	nest excavated (up to 1m diameter, 0.3m deep); eggs adhesive; nest guarded		
Pomoxis annularis	White crappie	up to 9 years (Wisconsin)	I, R[5]				May - Jun (Wisconsin)[4]	16 - 20	male defends nest; female driven into nest, eggs deposited in several separate spawning acts		
Pomoxis nigromaculatus	Black crappie	8 - 10 years	I, R	C	2 - 4 years	2 - 4 years	May - mid-Jul	19 - 20	adhesive eggs in 8 - 15" diamtrte colonial nest	26,000 - 65,000	3 - 5 days
Etheostoma exile	Iowa darter	3 years	N	C			May - Jun		deposited in groups of 3 - 7	500 - 2,000	9 - 10 days
Etheostoma nigrum	Johnny darter	3 - 4 years	I?	C			May - Jun		adhesive eggs	30 - 200	5 - 8 days
Perca flavescens	Yellow perch	9 - 10 years	N	C	3 years	4 years	Apr - Jun	~ 7 - 12	extruded in transparent, gelatinous, accordian folded string/tube; semibouyant; adhere to vegetation	36,000 - 109,000	8 - 10 days
Perina caprodes	Logperch		N	C			Jun		eggs abandoned; spawning causes eggs to be buried	1,000 - 3,000	
Percina maculata	Blackside darter	4 years	N	U			May - Jun	~ 17		1,000 - 1,700	6 days
Percina shumardi	River darter		N	C			Jun - Jul				

			STATUS[7]		MATURITY		SPAWNING				
SCIENTIFIC NAME	**COMMON NAME**	**LIFE SPAN**	**KWS**	**MC**	**MALE**	**FEMALE**	**TIME OF YEAR**	**TEMP (°C)**	**EGGS**	**NUMBER OF EGGS**	**HATCHING TIME**
Stizostedion canadense	Sauger	5 - 6 years (up to 12 years in cold water)	N	C	2 - 3 years	4 - 6 years	late May - early Jun	4 - 6	sticky before water hardening; semibouyant, non-adhesive; fall to bottom b/t gravel or boulders	9,000 - 96,000	25 - 29 days
Stizostedion vitreum	Walleye	10 - 12 years (up to 20 years in cold	N, trib	C	2 - 4 years	3 - 6 years	early - mid Jun	6 - 11	no nest; eggs sticky before water hardening; fall into crevices in substrate	~ 612000	12 - 18 days
Aplodinotus grunniens	Freshwater drum		N	A	2 - 3 years (Mississippi River)[4]	2 - 3 years (Mississippi River)[4]	mid - late Jun		eggs bouyant; floats on surface	200,000 - 340,000	25 - 30 hours (temp dependant)

Source: Decicco 1994; Hatch 2002; Ohio Department of Natural Resources unknown; Nelson and Paetz 1992; NYS Department of Environmental Conservation 1999, Rook 1999, Scott and Crossman 1973, and Stewart, K.W. 2004.

NOTES:

[1] - Scott & Crossman (1973) indicate spawning occurs in May in Ontario and as late as July in Wisconscin

[2] - Becker (1983) reports spawning commences at water tempertaure 20°C and continues for entire summer in Wisconscin and Michigan

[3] - Becker (1983) reports maximum of 5 years of fish twice the length of specimens reported in Manitoba

[4] - limited or no information reported in Manitoba; no studies conducted in Manitoba

[5] - no collections in Manitoba in the last 10 years

[6] - specific Manitoba data

[7] - N = native, I = introduced, R = rare, U = presence confirmed, abundance unknown, UC = uncommon, C = common, A = abundant

* = found in mainstem

TABLE P-4

HABITAT CONDITIONS OF FISH SPECIES KNOWN OR EXPECTED TO RESIDE IN THE RED RIVER AND ASSINIBOINE RIVERS

			STATUS[7]		HABITAT		
SCIENTIFIC NAME	**COMMON NAME**	**LIFE SPAN**	**KWS**	**MC**	**SPAWNING**	**JUVENILE**	**ADULT**
Ichthyomyzon castanaeus	Chestnut lamprey	18 mo	N	U	tributary streams; gravel/sand bottoms of medium current	ammocoetes: drift downstream burrow into soft bottom	main course of rivers
Ichthyomyzon unicuspis	Silver lamprey	12-20 mo	N	U	larger rivers in gravelly riffles	ammocoetes: burrow in mud annd silt at edge of river	larger rivers and lakes
Acipenser fluvescens	Lake sturgeon		N, R		swift water, rapids, 0.4-4.5 m depth,	highly productive shoal areas in lakes, large rivers	highly productive shoal areas in lakes, large rivers
Hiodon alsoides	Goldeye		N	C	pools in turbid rivers	quiet turbid waters of large rivers	quiet turbid waters of large rivers
Hiodon tergisus	Mooneye		N	R	over rocks in swift water areas		
Carassius auratus	Goldfish		I		warm, weedy shallows		
Couesius plumbeus	Lake chub		O	U			streams & rivers in south; lakes in north
Cypinella spiloptera	Spotfin shiner	up to 3 years	N, Pembina R		dependant on underwater objects, depth, current; crevices among boulders, fallen trees, etc.		low velocity, turbid waters of large rivers, substrate ranging from sand to mud and silt, depths < 0.5m
Cyprinus carpio	Carp	9 - 15 years	I	C	weedy, grassy shallows	remain in spawning areas	warm lakes, streams, ponds with organic matter
Hybognathus hankinsoni	Brassy Minnow		N, Pembina R	U	migration from lakes to tributary streams, silt bottom, sand bottom		cool, dark acid waters of silt-bottomed bog ponds
Luxilus comutus	Common shiner	4 years (Michigan)	N, Trib	U	tributaries on gravel in flowing water, at the head of gravelly riffles		pools and slower stretches of medium and small sized streams; over substrate ranging from silt and sand to gravel; prefers open water with beds of aquatic vegetation
Macrhybopsis storeriana	Silver chub*	3 years	N	C	unknown		slow-moving water over soft substrates
Margariscus margarita	Pearl dace	3 years		U	over substrates ranging from gravel to silt in quiet or flowing water 45 to 60 cm deep; male defends territory but no nest		cool, clear flowing waters in stained, tea-coloured water; associated with bog habitats in headwater streams and ponds
Nocomis biguttatus	Hornyhead Chub	4 years (Wisconsin)	1 record reported in Red River	U	nests of stones/pebbles built by male on fine gravel/pebble substrate below riffles in shallow water	along shorelines, in beds of aquatic vegetation, water depths of 30cm to 1m, over silty sand or gravel substrate	quiet, clear waters with aquatic vegetation in ponds, oxbow lakes or streams; over soft substrates < 2m deep; tolerant of low oxygen levels and can survive in waters subject to winter kill
Notemigomus chrysoleucas	Golden shiner	up to 5 years[3]	N, R	U	clear, quiet, weedy shores and tributaries	same as spawning	surface to mid-water, clear weedy shores, still to slow current, mud substrate with weed beds
Notropis atherinoides	Emerald shiner	3 years	N	A	gravel shoals of riverbeds and tributaries	mid-water to surface	still to moderate current of variety of substrates
Notropis blennius	River shiner		N	U	over sand, gravel bottom		

Table P-4 (con't.)

			STATUS[7]		HABITAT		
SCIENTIFIC NAME	**COMMON NAME**	**LIFE SPAN**	**KWS**	**MC**	**SPAWNING**	**JUVENILE**	**ADULT**
Notropis dorsalis	Bigmouth shiner	2 years (Wisconsin)[4]	N, Roseau & Pembina R's	U	likely mid-water		riffle and runs at moderately fast water velocities, moderatley turbid to turbid at depths of < 0.5m, occurs over gravel substrates
Notrpois heterodon	Blackchin shiner			U			clear weeded waters, quiet pools in creeks and rivers, weeded inshore waters of lakes
Notropis heterolepis	Blacknose shiner			U	quiet clear weedy bays & quiet streams; shallow water with gravel, sand, or muddy substrate		clear, vegetated waters
Notropis hudsonius	Spottail shiner			C	sandy shoals, gravel, riffles		lakes and larger streams and rivers, toerant of turbidity, common in relatively clear water, often associated with weed beds, prefers marginal waters with little to no current over substrates ranging from
Notropis rubellus	Rosyface shiner			U	gravelled riffle areas		flowing water of streams and rivers; fine gravel or sand substrate at confluence with larger streams or rivers
Notropis stramineus	Sand shiner	3 year (Wisconsin)[4]	N	U			riffle and runs in streams or along margins of rivers in depths < 0.3m, common over substrates of gravel or sand, tolerant of turbidity[6]
Notropis volucellus	Mimic shiner	2 years		U			still and quiet waters; individuals move offshore before dark
Phoxinus eos	Northern redbelly dace		N, Trib				boggy lakes, creeks, and ponds; quiet waters; substrate of fine detritus or silt
Chrosomus neogaeus	Finescale dace		N, Rat R		stained cool boggy lakes, streams and larger lakes		bog ponds, streams and lakes
Pimephales notatus	Bluntnose minnow		N, Rat R	U			
Pimephales promelas	Fathead minnow[6]	2 years (Wisconsin)[4]	N	C	under logs, rocks, and debris in quiet, shallow water	quiet, weedy shallows	still turbid waters, often found over fine substrate with cover vegetation in depths of 1m or less
Plalygobio gracillis	Flathead chub		N	U	in gravel or rubble, in fast water	shallow riffles, on gravel bottom	turbid main channels; bottom up to 2 m, fast current, sand, gravel, or rubble substrate
Rhinichthys atratulus	Blacknose dace	up to 5 years	N, lower	U	over gravel and silt in fast water of shallow riffles few inches deep		rivers and tributaries moderate to fast current, gravel substrate
Rhinichthys	Longnose dace	maximum 5 years (Wisconsin)	N	U	among boulders in rapids	quiet waters near shore	high energy habitats - rapids in streams, lake shores subject to wave action, under crevices between boulders, frequently in shallower water with higher velocity

			STATUS[7]		HABITAT		
SCIENTIFIC NAME	**COMMON NAME**	**LIFE SPAN**	**KWS**	**MC**	**SPAWNING**	**JUVENILE**	**ADULT**
Semotilus atronaculatus	Creek chub	7 years	N	U	small gravelly tributaries in smooth water above or below riffles	spawning tributaries of smooth waters	variety of current with variety of tributary substrates that are silt free
Carpiodes cyprinus	Quillback		N, 1 record	U	tributaries on mud in quiet water	bottom, main channel, on mud and sand	bottom, slow to moderate current, sand, silt, mud substrate
Catostomus catostomus	Longnose Sucker		N	C	streams where available; shallow areas of lakes; water depth 6-11"; over gravel	remain in gravel 1-2 weeks; 1 month later move towards lakes	lakes
Catostomus commersoni	White sucker		N	C	in fast water over gravel in main channel and tributaries	moderate to fast waters of river margins	warm shallow lakes, warm shallow bays, and tributary rivers of larger lakes
Ictiobus cyprinellus	Bigmouth buffalo			U	shallow water of small tributary streams and marshes of large lakes, flood lake margins		shallow depths in slow, sluggish, still water of large rivers, oxbow and flood plain lakes
Moxostoma anisurum	Silver redhorse		N	C	in main channel of turbid waters in shallow water, on gravel-rubble bottom	shallows, slow current, sand to gravel bottom, under protection of overhanging banks	turbid river, bottom, slow to moderate current, gravel preferred mud, clay, avoids heavy silt and sedimentation
Moxostoma erytrurum	Golden redhorse		N	R	in riffles in the main stream	slow-moving streams with soft bottoms	clear streams where riffles are composed of sand, gravel, boulders, bedrock; pools free of vegetation and silt
Moxostoma macrolepidotum	Shorthead redhorse	12 -14 years	N	C	on gravel and sand bars, fast riffles in tributary or main channel	gravel shoals along shore in strong current	rivers, not tolerant of heavy silt, bottom, sand gravel substrate
Ameiurus melas	Black bullhead	maximum 5 years (Wisconsin)[4]	N	C	in soft substrate under cutbanks, woody debris or other cover	quiet, weedy shorelines and tributaries	tributaries and mainstems of rivers with slow flowing current, more common in tributaries and peripheral waters, tolerant of turbid waters at depths of 2m or less, over substrate mud and silt
Ameiurus nebulosus	Brown bullhead	maximum 5 years (Wisconsin)[4]	N	C	sand and gravel substrates among aquatic roots near cover		tributaries and mainstems of rivers with moderate current, more common in mainstems, tolerant of turbid waters at depths of < 0.5m to 10m, warm water situations; larger slow-moving streams with abundant aquatic vegetation;
Ictalurus punctatus	Channel catfish[6]	up to 27 years	N	C	gravel to rubble substrates; under rocks, logs, cut banks in creeks	margins of main channel in moderate current	mainly benthic prefering "big water", mainstems of large rivers with strong currents and shear area between strong current and eddies, commonly at depths 2-5m in substrates ranging from gravel to rubble
Noturus flavus	Stonecat[6]		N	U	streams or shallow, rocky areas of lakes, typically under flat stones or utilizing human deposited refuse		riffles, rapids of moderate or large streams, bottom of loose rocks, tolerates turbid water, can be abundant in mainstems of large rivers and their tributaries, almost always among or under rocks in substrate sizes from coarse gravel to boulders

Table P-4 (con't.)

			STATUS[7]		HABITAT		
SCIENTIFIC NAME	**COMMON NAME**	**LIFE SPAN**	**KWS**	**MC**	**SPAWNING**	**JUVENILE**	**ADULT**
Noturus gyrinnus	Tadpole madtom[6]	2 -3 years	N	C	nests in cavities under logs and stones	dense weed beds on mud or gravel	quiet clear, weedy protected water, common in tributaries of larger rivers, remain in most dense stands of vegetation with substrat of mud or silt in depths of <
Esox lucius	Northern pike	10-12 years	N	C	weedy margins of river channels, pools, backwaters, tributaries	weedy margins of river channels, pools, backwaters, tributaries	mid-water to surface in slow current, variety of substrates, often weedy
Umbra limi	Central mudminnow	8 to 9 years	N	C	marginal waters and tributaries in weeds	marginal waters and tributaries in weeds	surface to bottom in marginal shallows, still to slow current, usually mud substrate, with cover
Osmerus mordax	Rainbow smelt		N		freshwater of inlet or outlet streams, and reefs and shorelines of lakes		prefers cool lakes, resrvoirs, or lake-like expansions of large rivers
Coregonus artedii	Cisco	upto 13 years	I lower, 1 record	C	in inland lakes, takes place when ice formed on shores in shallow water over any knid of bottom, often gravel or stony substrate		pelagic species, schooling in midwaters with depth dependant on water temperatures; general movement in spring from shallow to deeper waters and return in fall as upper water temperatures
Coregonus clupeaformis	Lake whitefish		N	UC	in shallow water over hard or stoney bottom or sand	shallow inlands waters	colder months spent in shoal waters and shallows to spawn, in warmer month move to deeper waters
Thymallus arcticus	Artic graylling	11 - 12 years	I, Fort Whyte Centre		adults migrate to small gravel/rock bottomed tributaries streams; after spawning adults return to lakes or rivers		clear waters of large, cold rivers, rocky creeks, lakes;
Oncorhynchus mykiss	Rainbow trout	5-9 years	I		smaller tributaries, beds of fine gravel in riffles above pools	may remain in spawning stream 1-3 years or migrate immediately to lake	stream dwelling: shallow rivers with moderate flow, gravel bottoms, pool-riffle type; lake dwelling: deep cool lakes with shallows and vegetation
Salmo trutta	Brown trout		I				
Salvelinus alpinus	Arctic char		I, escapees		over gravel or rocky shoals in lakes, quiet pools in rivers; must be deep to provide protection from winter ice		
Salvelinus fontinalis	Brook trout		I, William				
Peropsis omiscomayus	Trout-perch	~ 4 years	N	C	sand and gravel bottom in shallow water tributaries		shallow, sometimes turbid streams
Lota lota	Burbot		I	C	deep water on gravel	rocky shallows, shorelines and tributaries; fast to moderate current	bottom, deeper holes and channels, slow to still current, variety of substrates
Fundulus diaphanus	Banded Killfish			U			
Culaea inconstans	Brook stickleback[6]	up to 2 years	N	C	shallow waters of weedbeds	quiet, weedy shorelines	clear , cold, densely vegetated waters of small streams; swampy margins of lakes, bog ponds and streams.

			STATUS[7]		HABITAT		
SCIENTIFIC NAME	**COMMON NAME**	**LIFE SPAN**	**KWS**	**MC**	**SPAWNING**	**JUVENILE**	**ADULT**
Pungitius pungitius	Ninespine stickleback			C			
Morone chrysops	White bass	4 years (Mississippi River)	I, La Salle River	C	hard substrates ranging from sand to boulders and bedrock cutcrops		tolerant of turbidity, prefer shallow, highly productive lakes and larger, slow flowing rivers
Ambloplites rupestris	Rock bass			C	nests on sand or gravel; swamps to gravel shoals	litoral to limnetic	bottom, in shallow marginal water, still to moderate current, cover required, logs, weeds or rocks
Lepomis gibbosus	Pumpkinseed		N				
Lepomis macrochirus	Bluegill	8 - 10 years	N, R		firm bottom of gravel, sand, mud		lakes, streams and rivers that are shallow, weedy, warm water, heavily vegetated, slow flowing
Micropterus salmoides	Largemouth bass	15 years (Southern Ontario)[4]	I, Lake Minnewasta, Fort Whyte		gravel or rubble substrate	hatchlings form dense swarm accompanied by the male; male remains with young after feeding begins	lakes and larger rivers, quiet marginal waters, tolerant of turbidity, prefers cover of submerged wood or weed beds, substrates of mud or sand
Pomoxis annularis	White crappie	up to 9 years (Wisconsin)	I, R[5]		nests cleaned/excavated in finer grained substrates		lakes and rivers, prefers turbid waters, substrate ranging from mud/silt to gravel, found near cover, schooling fish spending time at mid depths
Pomoxis nigromaculatus	Black crappie	8 - 10 years	I, R	C	colonical nests on sand, gravel, mud substrate in shallow water with vegetation cover		clear, quiet, warm water in areas of low flow; dense vegetation; sandy to mucky bottom
Etheostoma exile	Iowa darter	3 years	N	C	shallow, quiet water on bottom organic debris or on fibrous roots under cutbanks		bottom, still to slow current, vegetation, organic debris sand, peat or mixed substrate, intolerant of turbid muddy water
Etheostoma nigrum	Johnny darter	3 - 4 years	I?	C	under rocks, in slow water	sand and gravel in current	bottom in shallow water, moderate to no flow, sand, grave, silt, rubble substrate
Perca flavescens	Yellow perch	9 - 10 years	N	C	shallows of lakes, tributaries in rooted vegetation and debris; over sand, gravel	quiet, weedy, marginal water, shoreline shallows	mid-water to bottom, in and near cover, still to slow current, most substrates
Perina caprodes	Logperch		N	C	sandy inshore shallows		sand, gravel, rocky substrate in swift water

			STATUS[7]		HABITAT		
SCIENTIFIC NAME	**COMMON NAME**	**LIFE SPAN**	**KWS**	**MC**	**SPAWNING**	**JUVENILE**	**ADULT**
Percina maculata	Blackside darter	4 years	N	U	gravel-bottom pools	utilizes mid-depths; less benthic	quiet regions, medium sized pools, gravelly substrate, prefers clear water
Percina shumardi	River darter		N	C			large rivers with rubble or boulder strewn gravel bottom; moderate current
Stizostedion canadense	Sauger	5 - 6 years (up to 12 years in cold water)	N	C	over sand and gravel bars in main current of turbid waters	margins and shallows of main channel	slow to fast water near bottom, variety of substrates
Stizostedion vitreum	Walleye	10 - 12 years (up to 20 years in cold water)	N, trib	C	riffle areas along shores over gravel substrate in tributaries	weedy shallows near shore	slow water near bottom, variety of substrates
Aplodinotus grunniens	Freshwater drum		N	A	in open water over bottom (spawning not observed); males emit croaking sound with increasing intensity during evening as light levels drop	pelagic larvae, juveniles over mud bottom in main channel	bottom of main channel over mud, sand, gravel

Source: Decicco 1994; Hatch 2002; Ohio Department of Natural Resources unknown; Nelson and Paetz 1992; NYS Department of Environmental Conservation 1999, Rook 1999, Scott and Crossman 1973, and Stewart, K.W. 2003.

NOTES:

[1] - Scott & Crossman (1973) indicate spawning occurs in May in Ontario and as late as July in Wisconscin

[2] - Becker (1983) reports spawning commences at water tempertaure 20 °C and continues for entire summer in Wisconscin and Michigan

[3] - Becker (1983) reports maximum of 5 years of fish twice the length of specimens reported in Manitoba

[4] - limited or no information reported in Manitoba; no studies conducted in Manitoba

[5] - no collections in Manitoba in the last 10 years

[6] - specific Manitoba data

[7] - N = native, I = introduced, R = rare, U = presence confirmed, abundance unknown, UC = uncommon, C = common, A = abundant

* = found in mainstem

TABLE P-5

MAMMALS POTENTIALLY OCCURRING WITHIN THE LAKE-OF-THE PRAIRIES REGIONAL SETTING

SCIENTIFIC NAME	COMMON NAME
Alces alces	Moose
Cervus elaphus	American elk
*Odocoileus hemionus**	Mule deer*
Odocoileus virginianus	White-tailed deer
Rangifer tarandus caribou	Woodland caribou
Canis latrans	Coyote
Canis lupus	Wolf
Vulpes vulpes	Red fox
Ursus americanus	American black bear
Felis lynx canadensis	Lynx
Lutra canadensis	River otter
Martes americana	American marten
Martes pennanti	Fisher
Mephitis mephitis	Striped skunk
Erethizon dorsatum	American porcupine
Sorex obscurus	Dusky Shrew
Mustela nivalis	Least weasel
Mustela frenata	Longtail weasel
Mustela erminea	Shorttail weasel
Mustela vison	American mink
Procyon lotor	Raccoon
Ondatra zibethicus	Muskrat
Castor canadensis	American beaver
Lasionycteris noctivagans	Silver-haired bat
Lasiurus borealis	Red bat
Lasiurus cinereus	Hoary bat
Myotis keeni	Keen myotis
Eptesicus fuscus	Big brown bat
Myotis lucifugus	Little brown bat
Lepus yownsendii	Whitetail Jack rabbit
Lepus americanus	Snowshoe hare
Blarina brevicauda	Short-tailed shrew
Microsorex hoyi	Pygmy shrew
Sorex arcticus	Arctic shrew

SCIENTIFIC NAME	COMMON NAME
Sorex cinereus	Masked shrew
Sorex palustris	American water shrew
Phenacomys intermedius	Heather vole
Clethrionomys gapperi	Gapper's red-backed vole
Microtus pennsylvanicus	Meadow vole
Microtus ochrogaster	Prairie vole
Onychomys leucogaster	Northern Grasshopper Mouse
Peromyscus maniculatus	Deer mouse
Zapus hudsonius	Meadow jumping mouse
Zapus princeps	Western jumping mouse
Eutamias minimus	Least chipmunk
Synaptomys borealis	Northern Pocket Gopher
Glaucomys sabrinus	Northern flying squirrel
Taxidea taxus	Badger
Marmota monax	Woodchuck
Spermophilus tridecemlineatus	Thirteen-lined ground squirrel
Citellus richardsoni	Richardson Ground Squirrel
Tamiasciurus hudsonicus	American red squirrel
Sciurus carolinensis	Eastern Gray Squirrel

Source: Banfield 1974; Burt and Grossenheider 1980; Manitoba Conservation 2003b and COSEWIC 2003

*classified as species at risk by MESA

TABLE P-6

BIRD SPECIES POTENTIALLY UTILIZING THE UPPER ASSINIBOINE RIVER BASIN

SCIENTIFIC NAME	COMMON NAME	STATUS[a]
Gavia immer	Common Loon	B
Podilymbus podiceps	Pied-billed Grebe	B
Podiceps auritus	Horned Grebe	B
Podiceps grisegena	Red-necked Grebe	B
Podiceps nigricollis	Eared Grebe	B
Aechmophorus occidentalis	Western Grebe	B
Pelecanus erythrorhynchos	American White Pelican	B
Cygnus columbianus	Tundra Swan	M
Phalacrocorax auritus	Double-crested Cormorant	B
Botaurus lentiginosus	American Bittern	B
Ardea herodias	Great Blue Heron	B
Nycticorax nycticorax	Black-crowned Night-Heron	B
Branta canadensis	Canada Goose	B
Chen caerulescens	Snow Goose	M
Aythya marila	Greater Scaup	B
Aix sponsa	Wood Duck	B
Anas crecca	Green-winged Teal	B
Anas americana	American Widgeon	B
Anas platyrhynchos	Mallard	B
Anas discors	Blue-winged Teal	B
Anas acuta	Northern Pintail	B
Anas strepera	Gadwall	B
Anas clypeata	Northern Shoveler	B
Aythya valisineria	Canvasback	B
Aythya americana	Redhead	B
Aythya collaris	Ring-necked Duck	B
Aythya affinis	Lesser Scaup	B
Bucephala albeola	Bufflehead	B
Melanitta fusca	White-winged Scoter	B
Oxyura jamaixensis	Ruddy Duck	B

SCIENTIFIC NAME	COMMON NAME	STATUS[a]
Bucephala clangula	Common Goldeneye	B
Lophodytes cucullatus	Hooded Merganser	B
Mergus merganser	Common Merganser	B
Mergus serrator	Red-breasted Merganser	M
Haliaeetus leucocephalus	Bald Eagle	M
Cathartes aura	Turkey Vulture	B,N
Circus cyaneus	Northern Harrier	B
Accipiter striatus	Sharp-shinned Hawk	B
Accipiter cooperii	Coopers Hawk	B
Accipiter gentilis	Northern Goshawk	B
Buteo platypterus	Broad-winged Hawk	B
Buteo swainsoni	Swainson's Hawk	B
Buteo lagopus	Rough-legged Hawk	M
Buteo jamaicensis	Red-tailed Hawk	B
Aquila chrysaetos	Golden Eagle	B
Pandion haliaetus	Osprey	B
*Falco peregrinus***	Peregrine Falcon**	M
Falco columbarius	Merlin	B
Falco sparverius	American Kestrel	B
Perdix perdix	Gray Partridge	A,I
Phasianus colchicus	Ring-necked Pheasant	B
Bonasa umbellus	Ruffed Grouse	A
Dendragapus canadensis	Spruce Grouse	A
Tympanuchus cupido	Greater Prairie-Chicken	B
Tympanuchus phasianellus	Sharp-tailed Grouse	B
*Coturnicops noveboracensis**	Yellow Rail*	B
Rallus limicola	Virginia Rail	B
Prozana carolina	Sora	B
Fulica americana	American Coot	B
Ardea herodias	Great Blue Heron	B
Grus canadensis	Sandhill Crane	B
*Charadrius melodus***	Piping Plover**	B

SCIENTIFIC NAME	**COMMON NAME**	**STATUS**[a]
Pluvialis dominica	Lesser Golden-Plover	M
Pluvialis squatarola	Black-bellied Plover	M
Charadrius semipalmatus	Semipalmated Plover	M
Charadrius vociferus	Killdeer	B
Recurvirostra americana	American Avocet	B,N
Tringa solitaria	Solitary Sandpiper	B
Catoptrophorus semipalmatus	Willet	B
Numenius americanus	Long-billed Curlew	B
Tringa melanoleuca	Greater Yellowlegs	M
Tringa solitaria	Lesser Yellowlegs	M
Actitis macularia	Spotted Sandpiper	B
Tryngites subruficollis	Buff-breasted Sandpiper	M
Calidris himantopus	Stilt Sandpiper	M
Limnodromus griseus	Short-billed Dowitcher	M
Limnodromus scolopaceus	Long-billed Dowitcher	M
Bartramia longicauda	Upland Sandpiper	B
Limosa fedoa	Marbled Godwit	B
Gallinago gallinago	Wilson's Snipe	B
Phalaropus tricolor	Wilson's Phalarope	B
Phalaropus lobatus	Red-necked Phalarope	M
Arenaria interpres	Ruddy Turnstone	M
Calidris melanotos	Pectoral Sandpiper	M
Calidris alba	Sanderling	M
Calidris fuscicollis	White-rumped Sandpiper	M
Calidris bairdii	Baird's Sandpiper	M
Calidris minutilla	Least Sandpiper	M
Calidris mauri	Western Sandpiper	M
Larus pipixcan	Franklin's Gull	B
Larus argentatus	Herring Gull	M
Larus philadelphia	Bonaparte's Gull	M
Larus delawarensis	Ring-billed Gull	B
Larus californicus	California Gull	B

SCIENTIFIC NAME	COMMON NAME	STATUS[a]
Sterna hirundo	Common Tern	B
Sterna forsteri	Forster's Tern	B
Childonias niger	Black Tern	B
Sterna caspia	Caspian Tern	M
Columba livia	Rock Dove	A
Zenaida macroura	Mourning Dove	B
Coccyzus erythropthalmus	Black-billed Cuckoo	B
Bubo virginianus	Great Horned Owl	A
Athene cunicularia	Burrowing Owl	B,N
Strix varia	Barred Owl	A
Asio otus	Long-eared Owl	B
Aegolius funereus	Boreal Owl	A
*Asio flammeus**	Short-eared Owl*	B
Strix nebulosa	Great Gray Owl	A
Nyctea scandiaca	Snowy Owl	W
Aegolius acadicus	Nothern Saw-whet Owl	A
Chordeiles minor	Common Nighthawk	B
Caprimulgus vociferus	Whip-poor-will	B
Chaeura pelagica	Chimney Swift	B
Archilochus colubris	Ruby-throated Hummingbird	B
Ceryle alcyon	Belted Kingfisher	B
Sphyrapicus varius	Yellow-bellied Sapsucker	B
Picoides pubescens	Downy Woodpecker	A
Picoides villosus	Hairy Woodpecker	A
Picoides tridactylus	American Three-toed Woodpecker	A
Colaptes auratus	Northern Flicker	B
Dryocopus pileatus	Pileated Woodpecker	A
Contopus borealis	Olive-sided Flycatcher	M
Contopus sordidulus	Western Wood-Pewee	B
Empidonax flaviventris	Yellow-bellied Flycatcher	M
Empidonax alnorum	Alder Flycatcher	B
Empidonax minimus	Least Flycatcher	B

SCIENTIFIC NAME	COMMON NAME	STATUS[a]
Sayornis phoebe	Eastern Phoebe	B
Myiarchus crinitus	Great Crested Flycatcher	B
Tyrannus verticalis	Western Kingbird	B
Tyrannus tyrannus	Eastern Kingbird	B
Eremophila alpestris	Horned Lark	B
Progne subis	Purple Martin	B
Vireo solitarius	Blue-headed Vireo	M
Vireo gilvus	Warbling Vireo	B
Vireo philadelphicus	Philadelphia Vireo	M
Vireo olivaceus	Red-eyed Vireo	B
Perisoreus canadensis	Gray Jay	A
Cyanocitta cristata	Blue Jay	A
Pica pica	Black-billed Magpie	A
Corvus brachyrhynchos	American Crow	B
Corvus corax	Common Raven	A
Tachycineta bicolor	Tree Swallow	B
Riparia riparia	Bank Swallow	B
Hirundo rustica	Barn Swallow	B
Hirundo pyrrhonota	Cliff Swallow	B
Parus atricapillus	Black-capped Chickadee	A
Sitta canadensis	Red-breasted Nuthatch	A
Sitta carolinensis	White-breasted Nuthatch	A
Certhia americana	Brown Creeper	B
Troglodytes aedon	House Wren	B
Troglodytes troglodytes	Winter Wren	M
Cistothorus platensis	Sedge Wren	B
Cistothorus palustris	Marsh Wren	B
Regulus satrapa	Golden-crowned Kinglet	M
Regulus calendula	Ruby-crowned Kinglet	M
Sialia sialis	Eastern Bluebird	B
Sialia currucoides	Mountain Bluebird	B
Catharus fuscescens	Veery	B

SCIENTIFIC NAME	COMMON NAME	STATUS[a]
Catharus ustulatus	Swainson's Thrush	B
Catharus minimus	Gray-cheeked Thrush	M
Catharus guttatus	Hermit Thrush	B
Turdus migratorius	American Robin	B
Dumetella carolinensis	Gray Catbird	B
Toxostoma rufum	Brown Thrasher	B
*Anthus spragueii**	Sprague's Pipit*	B
Anthus spinoletta	Water Pipit	M
Bombycilla garrulus	Bohemian Waxwing	W
bombycilla cedrorum	Cedar Waxwing	B
*Lanius ludovicianus***	Loggerhead Shrike**	B
Lanius excubitor	Northern Shrike	W
Sturnus vulgaris	European Starling	A
Vermivora peregrina	Tennessee Warbler	M
Vermivora celata	Orange-crowned Warbler	B
Vermivora ruficapilla	Nashville Warbler	B
Dendroica petechia	Yellow Warbler	B
Dendroica pensylvanica	Chestnut-sided Warbler	B
Dendroica magnolia	Magnolia Warbler	B
Dendroica tigrina	Cape May Warbler	B
Dendroica coronata	Yellow-rumped Warbler	B
Dendroica virens	Black-throated Green Warbler	B
Mniotilta varia	Black-and-white Warbler	B
Dendroica fusca	Blackburnian Warbler	B
Dendroica castanea	Bay-breasted Warbler	M
Dendroica striata	Blackpoll Warbler	M
Dendroica palmarum	Palm Warbler	M
Setophaga ruticilla	American Redstart	B
Seiurus aurocapillus	Ovenbird	B
Seiurus noveboracensis	Northern Waterthrush	B
Oporornis agilis	Connecticut Warbler	B
Oporornis philadelphia	Mourning Warbler	B

SCIENTIFIC NAME	COMMON NAME	STATUS[a]
Geothlypis trichas	Common Yellowthroat	B
Wilsonia canadensis	Canada Warbler	B
Wilsonia pusilla	Wilson's Warbler	M
Pheucticus ludovicianus	Rose-breasted Grosbeak	B
Pipilo erythrophthalmus	Rufous-sided Towhee	B
Spizella passerina	Chipping Sparrow	B
Spizella pallida	Clay-colored Sparrow	B
Pooecetes gramineus	Vesper Sparrow	B
Spizella arborea	American Tree Sparrow	M
Zonotrichia querula	Harris' Sparrow	M
Zonotrichia leucophrys	White-crowned Sparrow	M
Passerella iliaca	Fox Sparrow	M
Passerculus sandwichensis	Savannah Sparrow	B
*Ammodramus bairdii****	Baird's Sparrow***	B
Ammodramus leconteii	Le Conte's Sparrow	B
Ammodramus caudacutus	Sharp-tailed Sparrow	B
Melospiza melodia	Song Sparrow	B
Melospiza lincolnii	Lincoln's Sparrow	B
Melosppiza georgiana	Swamp Sparrow	B
Zonotrichia albicollis	White-throated Sparrow	B
Calcarius lapponicus	Lapland Longspur	M
Calcarius pictus	Smith's Longspur	M
Plectrophenax nivalis	Snow Bunting	M
Junco hyemalis	Dark-eyed Junco	B
Passerina cyanea	Indigo Bunting	B
Dolichonyx oryzivorus	Bobolink	B
Agelaius phoeniceus	Red-winged Blackbird	B
Sturnella neglecta	Western Meadowlark	B
Xanthocephalus xanthocephalus	Yellow-headed Blackbird	B
Euphagus carolinus	Rusty Blackbird	B
Euphagus cyanocephalus	Brewer's Blackbird	B
Quiscalus quiscula	Common Grackle	B

SCIENTIFIC NAME	COMMON NAME	STATUS[a]
Molothrus ater	Brown-headed Cowbird	B
Icterus galbula	Northern Oriole	B
Carpodacus purpureus	Purple Finch	B
Loxia leucoptera	White-winged Crossbill	A
Loxia curvirostra	Red Crossbill	A
Carduelis pinus	Pine Siskin	B
Carduelis tristis	American Goldfinch	B
Cocoothraustes vespertinus	Evening Grosbeak	A
Pinicola enucleator	Pine Grosbeak	W
Passer domesticus	House Sparrow	A
Cardurlis hornemanni	Hoary Redpoll	W
Cardurlis flammea	Common Redpoll	W

Source: Godfrey 1986; Robbins et al. 1983; COSEWIC 2003

Note:

* deemed species at risk by COSEWIC

** deemed species at risk by both COSWEIC and MESA

***deemed species at risk by MESA only

[a] B = breeding, M = migrant, P = permanent resident, N = northern range,
W = winter range, I = introduced

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TABLE P-7

AMPHIBIANS AND REPTILE SPECIES POTENTIALLY OCCURRING WITHIN THE UPPER ASSINIBOINE RIVER BASIN

SCIENTIFC NAME	COMMON NAME
Bufo americanus	American and Canadian toad
Hyla crucifer	Northern spring peeper
Pseudacris triseriata	Boreal chorus frog
*Rana pipiens**	Northern Leopard frog*
Rana sylvatica	Wood frog
Ambystoma tigrinum diaboli	Gray tiger salamander
Chrysemys picta	Western painted turtle
Chelydra serpentina	Common snapping turtle
Thamnophis radix	Western plains garter snake
Storeria occipitomaculata	Northern redbelly snake
Thamnophis sirtalis	Red-sided garter snake

Source: Preston 1982 and COSEWIC 2003

* species listed as special concern by COSEWIC

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